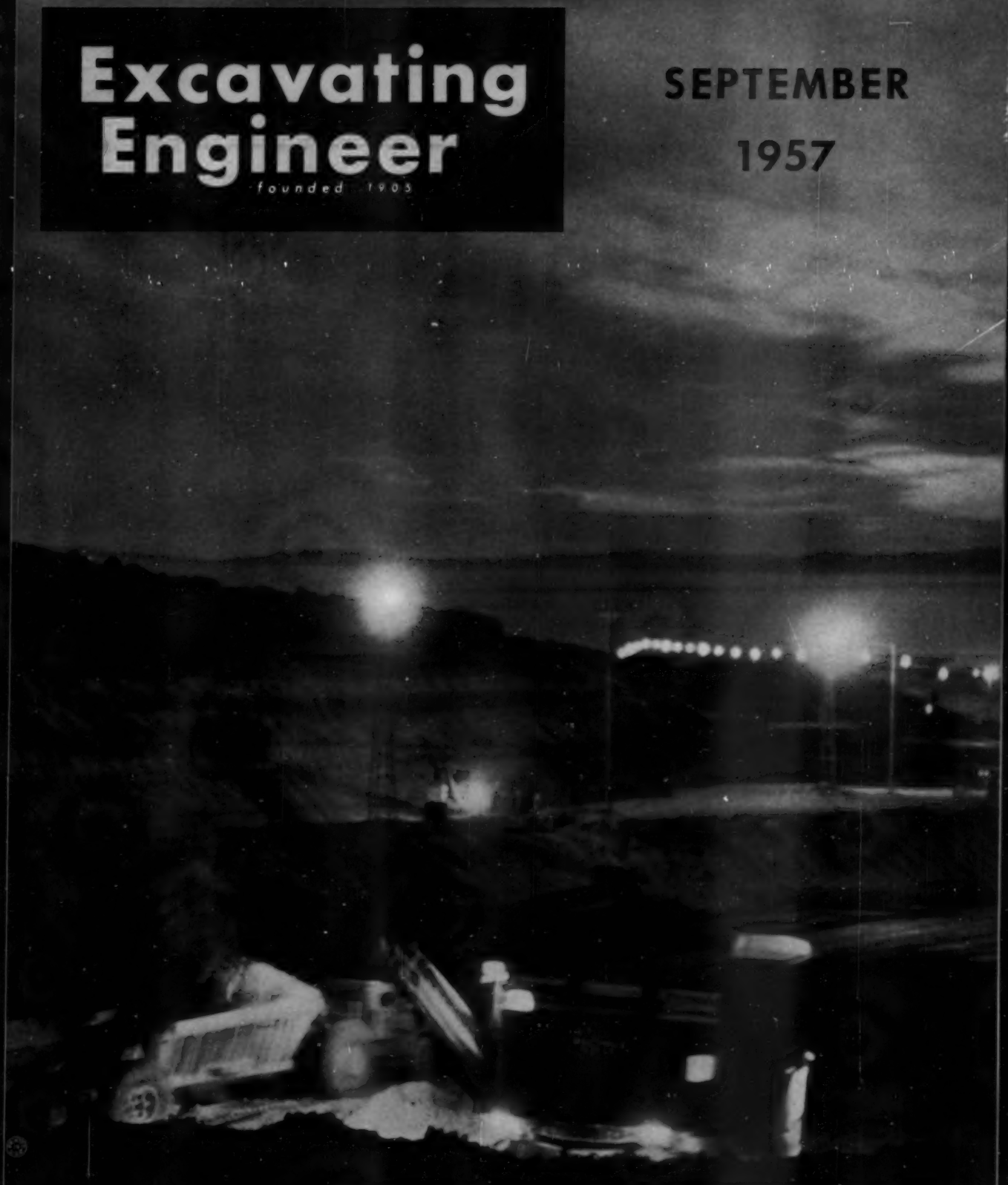
Excavating Engineer

founded 1905

SEPTEMBER

1957



Excavation of material for Southern Pacific's railroad fill across Great Salt Lake continues at night as an electric shovel dumps an 8-yd. load of sand and gravel into a 25-ton bottom-dump truck. Completion of the 32-million-yd. job by the contractor, Morrison-Knudsen Co., Inc., Boise, Idaho, will take about four years. Feature articles begin on pages 22 and 28.

Transit Crane Speed, Special Features Increase Construction Profits

Steel erection and stone setting for a new church in Pennsylvania were handled by this Transit Crane. Equipped with controls for precision work, these machines have the strength and power to handle heavy loads economically.

Transit Cranes are speedy two ways — on the road and on the job. The 15-B, for instance, travels along the highway at speeds up to 33 mph.

Once on the job, Transit Crane features put speed into lifting and digging assignments. Important standard features — friction swing brake in addition to regular swing lock, independent power controlled lowering boom hoist, and power controlled lowering for the main hoist line — permit accurate placement of loads.

Also standard are safety boom stops and open-throat booms to permit rigging hoist rope for 2, 3, and 4 parts of line. Pendant-type boom suspension with multiple part operating line between A-frame and bridle is ideal for changing boom lengths conveniently.

On all Transit Cranes, two extendible outriggers on each side of carrier chassis provide the stability needed for handling capacity loads. These machines are designed to perform equally well as crane, clamshell, dragline, hoe, or shovel.

Transit Cranes are available in three sizes — the 15-ton (capacity) 15-B, 25-ton 22-B, and 35-ton 30-B, convertible to ½-, ¾-, and 1-yd. excavators respectively. Your nearby Bucyrus-Erie distributor has complete information on these machines. See him today.

326E57C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WIS.

Transit Cranes move in . . . perform big lifts right on city streets. This Transit Crane lifts materials for an air conditioning unit to the roof of a 7-story building in Pennsylvania.

Up it goes! Sturdy outriggers provide good stability, precision controls permit accurate placement as this 15-B lifts screening equipment to the roof of a feed company building in California.

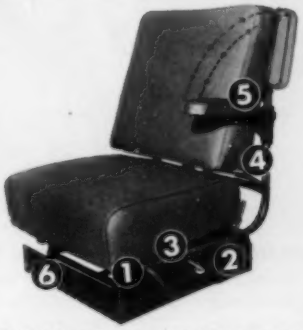
Wherever careful placement of loads is essential, Transit Cranes do the job. In New York state, this Transit Crane handles precast concrete flooring for a new building.

The Feature That Makes a Great Truck Even Greater...

The Autocar Driver Cab

Designed with your driver's comfort, safety in mind

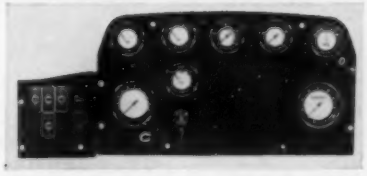
Cab is built like a skyscraper around a rigid structural steel frame. All welded, no rivets. Cab is spring-mounted to frame, absorbs shock, rolls with weaving. Heavy gauge sheet metal preserves that new look. All aluminum cab available; saves approximately ⅓ in weight.



Full-Adjust Seat, adjustable at many different locations, is almost infinitely adaptable to any driver's requirements. Levers permit driver to change posture while in motion.

1. Lever moves front of seat up or down.
2. Lever moves back of seat up or down.
3. Release to move seat back and forth.
4. Lever adjusts back rest.
5. Arm rest moves up out of way.
6. Entire seat platform can be raised or lowered.

Big windshield, curved to eliminate sidepost obstruction, pushes out in an emergency under 40 lb. pressure.



Instruments, grouped on panel directly in front of driver, are designed for long, trouble-free performance. Electrical terminals are clinched, soldered, and covered with rubber boot. Circuit breakers speed restoration of service in the event of a short circuit.

Extra-large rear window with optional sliding panel for ventilation; also permits driver to direct winching.

These are only four of many features that make the Autocar Driver Cab the most completely satisfactory cab for use on or off the highway. To help your drivers stay fresh during a full day's work, the same careful attention has been devoted to every detail of the cab. When you order your next truck or tractor, order it with your driver's comfort and safety in mind and buy an Autocar. See your White-Autocar distributor today.

AUTOCAR TRUCKS

AUTOCAR DIVISION, The White Motor Company

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White Autocar

On Yazoo River Basin Project, Yazoo County, Miss.

PIONEER GETS HIGH PRODUCTION FROM CAT* LOWBOWL SCRAPERS

DW20-NO. 456 LOWBOWL SCRAPER is push-loaded by a giant D9 Tractor. LOWBOWL design loads more material with less resistance clear to the end of the loading cycle for quicker heaped loads.

DW21-NO. 470 LOWBOWL SCRAPER speeds heaped load on haul. Turbocharged 6-cylinder Cat Engine, also in the DW20, delivers 300 HP (maximum output)—power aplenty for working in tough conditions.

At the time these pictures were taken, Pioneer Contracting Co., Inc., Memphis, had completed 100 working days of a schedule calling for 600. The project, involving 2,045,000 cu. yd. of earthmoving on the Yazoo River Basin, covers some 7 miles of work on channels, levees, drainage ditches and road relocation. There's a fleet of Caterpillar-built units on the job, including two DW20-No. 456 LOWBOWL Scrapers, a DW21-No. 470 LOWBOWL Scraper and a giant D9. They work 24 hours a day, 5 days a week. Says Pioneer's Scraper Foreman R. C. Parker: "We prefer Caterpillar-built equipment because of ease of operation. You can also depend on them for a minimum of down time. And wherever we are, Caterpillar Dealer service is always available."

Reports from job after job show that, under identical job conditions, Cat LOWBOWL Scrapers get bigger loads faster than competitive units. Both the four-wheel DW20-No. 456 and the two-wheel DW21-No. 470 have capacities of 18 cu. yd. struck and 25 cu. yd. heaped. Their LOWBOWL design loads more material with less resistance clear to the end of the loading cycle for quicker heaped loads. And the Turbocharged 6-cylinder Caterpillar Engine delivers 300 HP (maximum output) for fast loading, hauling against adverse grades and dumping in tough going.

Whether you're a two-wheel or a four-wheel man, you can count on profitable production from LOWBOWL Scrapers. Your Caterpillar Dealer will be glad to show you competitive production facts and figures from actual jobs. Better still, name the date—he'll demonstrate on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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Excavating Engineer

founded 1905

South Milwaukee, Wisconsin

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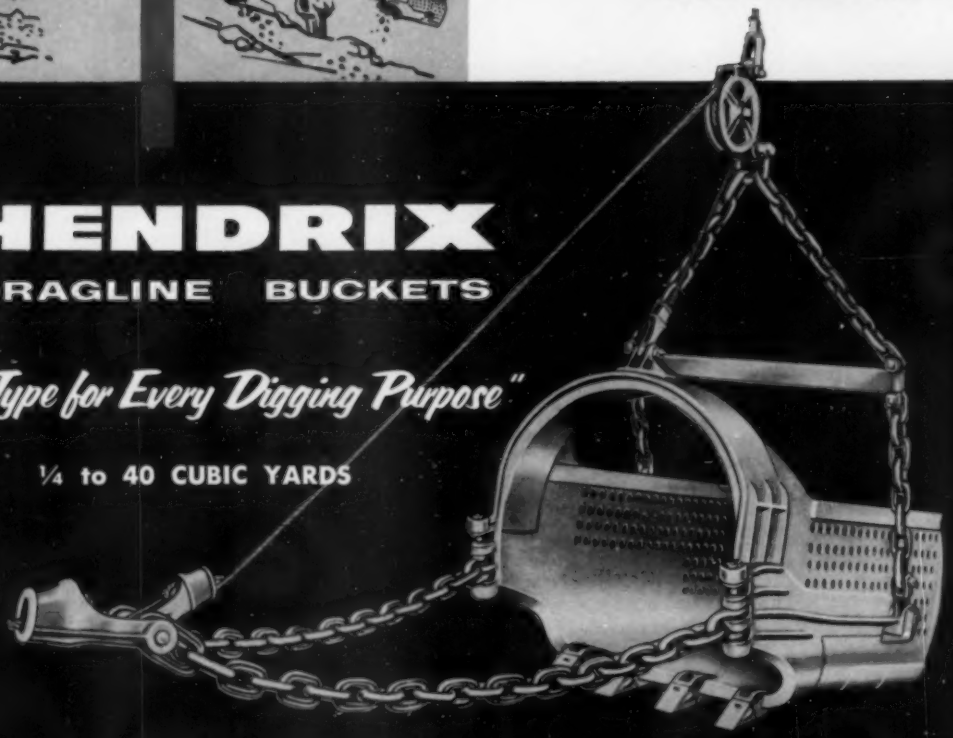

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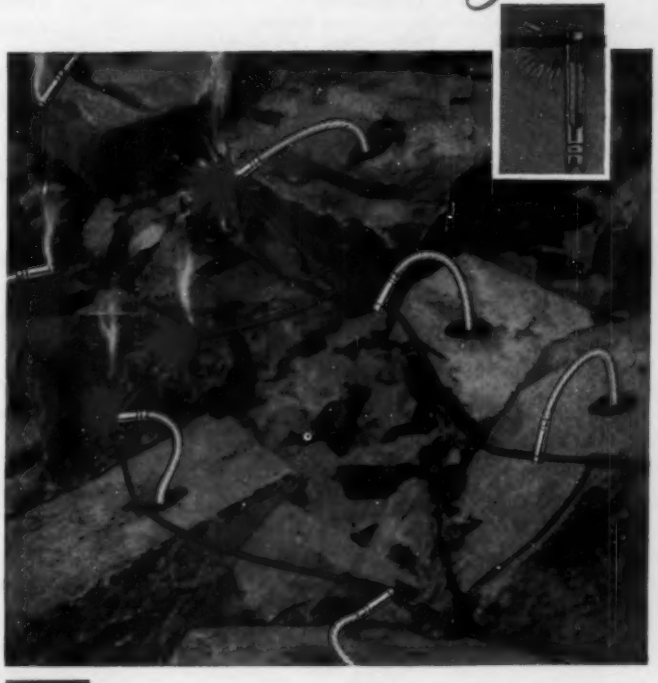

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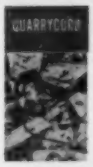

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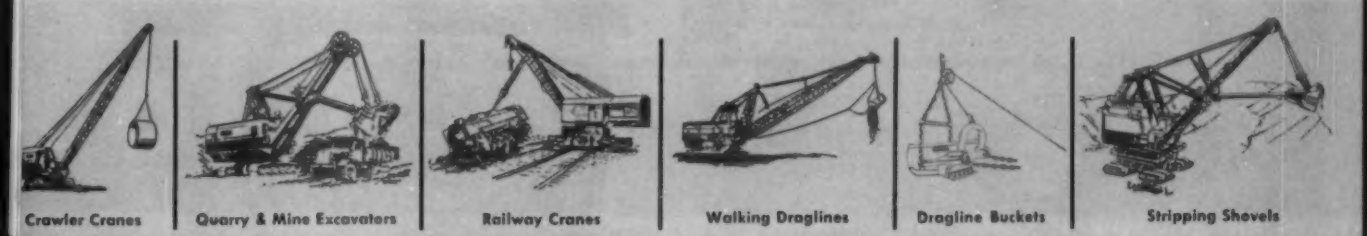

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BRITISH HONDURAS: R. H. Eyles, Belize.

BRITISH ISLES: Ruston-Bucyrus Ltd., London and Glasgow.
Ruston & Hornsby Ltd., Bristol.

CAMBODIA: Denis Freres d'Indochine, Saigon.

CAMEROUN: See French Union.

CEYLON: Brown & Co. Ltd., Colombo.

CHILE: Grace y Cia (Chile) S. A., DIVISION INTERNATIONAL MACHINERY, Santiago and Antofagasta.

COLOMBIA: International General Electric, S. A., Inc., Barranquilla, Bogota, Cali, and Medellin.

COSTA RICA: Alberto L. Arce S. A., San Jose.

CUBA: Armando J. Valdes & Cia., Havana.

CYPRUS: The Cyprus Commercial Co. Ltd., Nicosia.

DENMARK: E. T. Grew A/S, Copenhagen.

DOMINICAN REPUBLIC: La Antillana Comercial e Industrial, C. por A., Ciudad Trujillo.

ECUADOR: M. Ribadeneira Saenz, Quito.

EGYPT: The Tractor & Engineering Co. S. A. E., Cairo and Alexandria.

EIRE & NORTHERN IRELAND: Ruston & Hornsby Ltd., Dublin.

EL SALVADOR: Casa B. Sol-Millet, San Salvador.

ETHIOPIA & ERITREA: Paul Ries & Sons (Ethiopia) Ltd., Addis Ababa.

FIJI ISLANDS: Morris Hedstrom Ltd., Suva.

FINLAND: Aktiebolaget Ekstroms Maskinaffar, Helsingfors.

FRENCH UNION

FRANCE: Ets. J. Couthon-Brunner & Marchand (E. C. O. B. E. M.), Paris.

— Their sub-distributors —

ALGERIA: Societe "IMEX", Algiers.

CAMEROUN: Compagnie Francaise de l'Afrique Occidentale (C. O. F. A. O.), Douala.

FRENCH EQUATORIAL AFRICA: C. O. F. A. O., Brazzaville.

FRENCH WEST AFRICA: C. O. F. A. O., Dakar, Senegal; Abidjan, Ivory Coast.

MADAGASCAR: Soc. F. Bonnet & Fils, Tananarive.

GERMANY: W. Strikfeldt & Co., Gummersbach, Rheinland, West Germany.

GHANA: Holman Bros. Ltd., Takoradi.

GREECE: Alec C. Triandafyllides, Athens.

GUATEMALA: Comercial MacDonald (Guatemala) S. A., Guatemala City.

HAITI: Compagnie Haitienne de Moteurs, S. A., Port-au-Prince.

HAWAIIAN ISLANDS: Theo. H. Davies & Co., Ltd., Honolulu and Hilo.

INDIA: Greaves Cotton & Co. Ltd., Bombay, Calcutta, Kanpur, Madras, and New Delhi.

INDONESIA: Lindeteves N. V., Amsterdam, Netherlands.

IRAN: Soufar Trading Co. Ltd., Teheran.

IRAQ: John Birch & Co. (Iraq) Ltd., Baghdad, Margil, and Mosul.

ISRAEL: Agricultural Engineering Co. of Israel Ltd., Haifa.

ITALY: M. I. D. E. C., Macchine Minerarie Edili ed Industriali, Milan.

JAMAICA: H. E. Robinson & Co. (Jamaica) Ltd., Kingston. (Excavators). Caribbean Industrial Equipment, Ltd., Kingston. (Water Well Drills).

JAPAN: Daiichi Bussan Kaisha, Ltd., Tokyo.

JORDAN: Nagib Baki & Sons (Transjordan) Ltd., Amman. (Drills only).

KENYA: Gailey & Roberts Ltd., Nairobi.

KOREA: American Trading Co., Inc., Seoul.

KUWAIT: T. Ward Brown, Mohamed Abdul Rahman Al-Bahar, Kuwait.

LAOS: Denis Freres d'Indochine, Saigon.

LEBANON: Nagib Baki & Sons, Beirut. (Drills only).

LIBERIA: Liberia Tractor & Equipment Co., Monrovia.

LIECHTENSTEIN: Robert Aebi & Co. Ltd., Zurich, Switzerland.

LUXEMBURG: Tractor & Equipment Co., S. A., (TRECO), Brussels, Belgium.

MADAGASCAR: See French Union.

MALAYAN FEDERATION: Harper Gilfillan & Co. Ltd., Kuala Lumpur, Selangor.

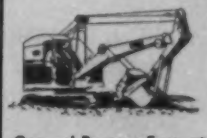
Water Well Drills

Oil Well Drills

Blast Hole Drills

Rotary Drills

Hydrocranes


General Purpose Excavators

Transit Cranes

ALL OVER THE WORLD

US EXCAVATORS, CRANES and DRILLS

MEXICO: Equipos Mecanicos, S. A., Mexico 5, D. F.; Chihuahua, Guadalajara, and Hermosillo.
Equipos Mecanicos del Norte, S. A., Monterrey and Tampico.
Equipos Mecanicos de la Laguna, S. A., Torreon.
Tubos y Equipos de California, S. A., La Paz. (EMSA Sub-Distributor, Territory of Baja California).
Crook Company, Los Angeles, California. (Excavators in State of Baja California).
Drilling & Mining Equipment Co., Los Angeles, California. (Water Well Drills in State of Baja California).
Bill Johnson Equipment Co., Phoenix, Arizona. (Water Well Drills in State of Sonora).

MOROCCO: Etablissements Groslin, Casablanca.

MOZAMBIQUE: Monteiro Gomes, Ltda., Lourenco Marques.

NETH. NEW GUINEA: Lindeteves N. V., Amsterdam, Netherlands.

NETHERLANDS: Wynmalen & Hausmann N. V., Rotterdam.

NEW ZEALAND: John Burns & Co. Ltd., Auckland, Christchurch, Greymouth, and Wellington.

NIGERIA: Holman Bros., Ltd., Apapa.

NORTHERN RHODESIA: Hubert Davies & Co. Ltd., Lusaka and Ndola.

NORWAY: Maskin A/S Pay and Brinck, Oslo.

PAKISTAN: Greaves Cotton & Co. (Pakistan) Ltd., Dacca, Karachi, and Lahore.

PANAMA: Guardia y Cia S. A., Panama.

PARAGUAY: General Electric Argentina, S. A., Buenos Aires, Argentina.

PERU: International Machinery Co., Lima.

PHILIPPINES: G. A. Machineries Inc., Manila.
Lilestone & Co., Inc., Manila.

PORTUGAL: Monteiro Gomes, Ltda., Lisbon.

PUERTO RICO & VIRGIN ISLANDS: Ulpiano Casal, Inc., San Juan, Puerto Rico.

SAAR: Ets. J. Couthon-Brunner & Marchand (E. C. O. B. E. M.), Paris, France.

SAUDI ARABIA: The Arabian Trading Co., Jeddah.
John Birch & Co. (Saudi Arabia) Ltd., Damman.

SINGAPORE: Harper Gilfillan & Co. Ltd., Singapore.

SOUTHERN RHODESIA: Hubert Davies & Co. Ltd., Salisbury, Bulawayo, and Gwelo.

SPAIN (incl. Colonies): Gummersindo Garcia, S. A., Madrid.

SUDAN: Sudan Mercantile Co. (Engineers) Ltd., Khartoum; Sudan Mercantile (Wad Medani) Ltd., Wad Medani; Sudan Mercantile (Port Sudan) Ltd., Port Sudan.

SURINAM: J. F. D. Haenen Co. Ltd., Paramaribo.

SWEDEN: Tornborg & Lundberg A/B, Stockholm.

SWITZERLAND: Robert Aebi & Co. Ltd., Zurich.

SYRIA: Barada Trading & Engineering Co. S. A., Damascus. (Drills only).

TAIWAN: Wayfoong & Co., Taipei.

TANGANYIKA: Gailey & Roberts (Tanganyika) Ltd., Dar es Salaam.

THAILAND: Gerson & Sons Ltd., Bangkok.
Harper Gilfillan & Co. Ltd., Kuala Lumpur, Selangor.

TRIESTE: M. I. D. E. C., Macchine Minerarie Edili ed Industriali, Milan, Italy.

TRINIDAD: Neal & Massy Engineering Co., Ltd., Port-of-Spain.

TUNISIA: MINE-USINE et COMPTOIR DES MINES Reunis, Tunis.

TURKEY: Said Dormen ve Ort, Istanbul.

UGANDA: Gailey & Roberts (Uganda) Ltd., Kampala.

UNION OF SOUTH AFRICA & SOUTHWEST AFRICA: Hubert Davies & Co., Ltd., Johannesburg, Bloemfontein, Welkom, Durban, East London, Port Elizabeth, and Capetown.

URUGUAY: General Electric, S. A., Montevideo.

VENEZUELA: General Electric de Venezuela, S. A., Caracas, Maracaibo, and Puerto La Cruz. (Excavators).

VIETNAM: Denis Freres d'Indochine, Saigon.

YUGOSLAVIA: Intercommerce, Belgrade.

Capacities Available

General Purpose Excavators and Cranes — ⅜ to 4 cubic yards (0.28 to 3.1 cubic meters) capacity.

Hydrocranes — 5-ton crane (4.5 metric ton): ⅜ cubic yard excavator (0.28 cubic meters). 10-ton crane (9.1 metric ton): ½ cubic yard excavator (0.38 cubic meters).

Quarry and Mine Shovels and Draglines — 2½ to 8 cubic yards (2 to 6 cubic meters) capacity.

Stripping Shovels — 2 to 65 cubic yards (1.5 to 49.7 cubic meters) capacity.

Blast Hole Drills (Cable Tool) for 6, 6⅝, 9, and 12 inch (150, 170, 230, and 305 millimeter) holes.

Blast Hole Drills (Rotary) for 6¾ to 9-in. holes (170 to 230 millimeters); for 9⅞ to 12¼-in. (250 to 310 millimeter) holes.

Walking Draglines — 4 to 33 cubic yards (3.1 to 25.2 cubic meters) capacity.

Railway Cranes — 160 and 250 ton (145 and 227 metric ton) capacity.

Water Well Drills for depths of 500, 1000, and 1500 feet (150, 305, and 455 meters).

Oil Well Drills for depths of 1500, 2500, 3500, and 6000 feet (455, 760, 1070, and 1830 meters).

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Crawler Cranes

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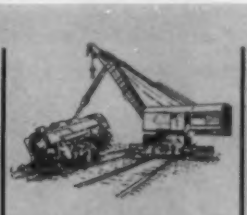
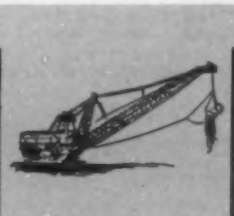
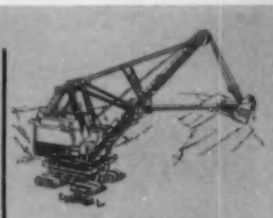

Railway Cranes


Walking Draglines

Dragline Buckets


Stripping Shovels

Ouija boards are passé

Time was, when a person had a question, out would come the ouija board for an answer. This wasn't too accurate a system, of course... but a lot of people put a lot of faith in what the ouija board told them.

Times change — and today accuracy is the keyword. That's why the modern business publication wants its circulation audited.

In joining BPA* the publisher is taking an important step toward sound and accurate planning in your behalf. It means that he is checking, double-checking and constantly rechecking —

- **Who you are**
- **Where you work**
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He wants and needs this information — and the BPA* audit can assure both him and his advertisers that he is getting his magazine into the hands of people *qualified by their common interests* to receive it. It helps him to give you —

- **Editorials that will *help you in your work***
- **Advertising that will *have value to you***

He can serve you even better if you will complete surveys and questionnaires which he may send you, and if you will give him your thoughts and opinions on the editorials and advertisements in his magazine.

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You, the reader, benefit when the circulation of a publication is audited by...

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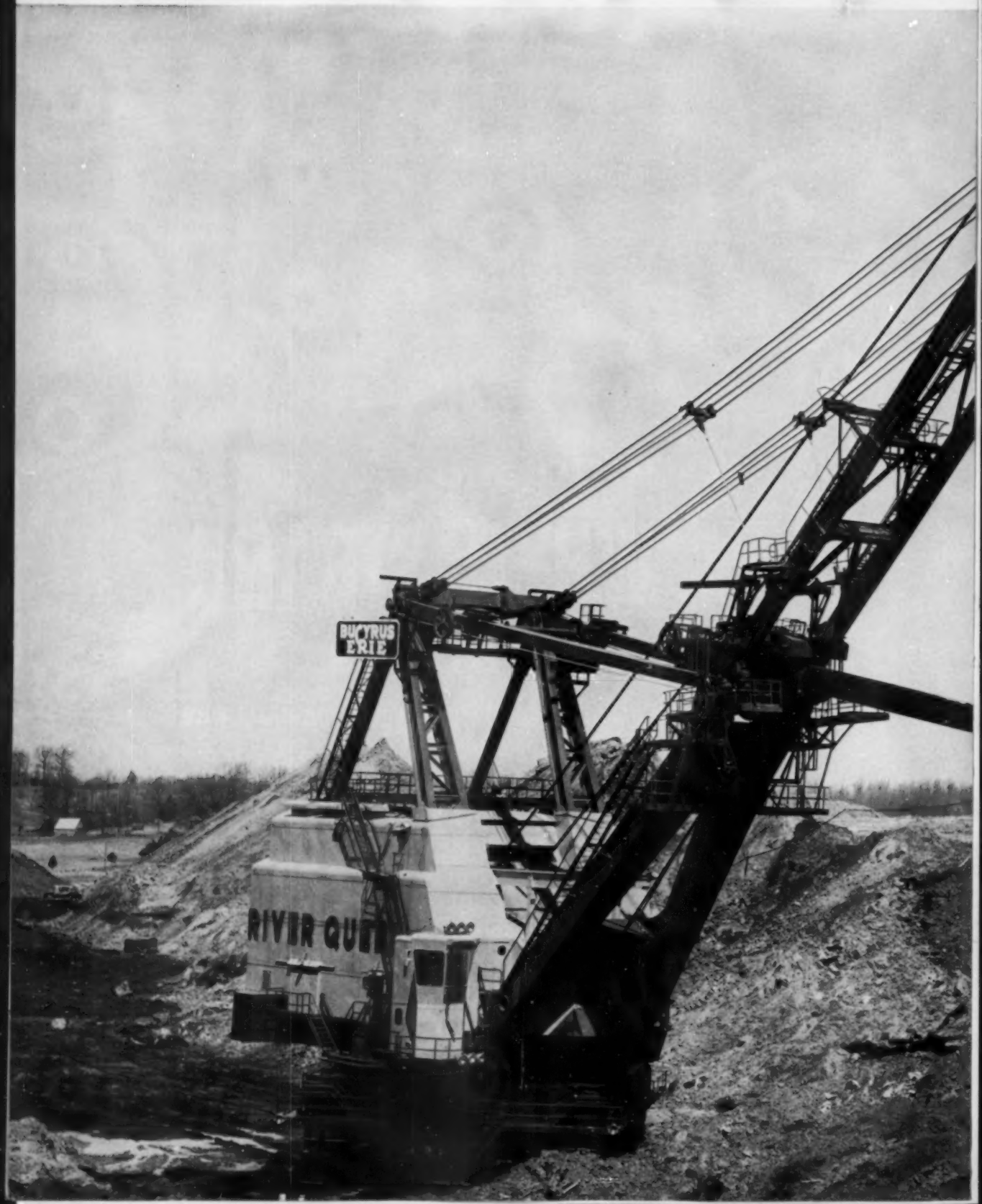
Direct-current System Powers



Bucyrus-Erie's Giant "River Queen"

Direct-current drive system proves best source of both power and control—vital factors in shovel operations

Power alone is only half the story in shovel operations. *Control* is also a vital factor. And, with direct-current drives you get both high-torque power and instantaneous control for efficient, economical shovel operation.

"RIVER QUEEN," Bucyrus-Erie's giant 55-cubic yard strip shovel is an outstanding example of combined direct-current power and control in action. D-c equipped, the "Queen" is used for overburden stripping at the River Queen mine near Central City, Kentucky. This mine is owned jointly by Peabody Coal Co. and W. G. Duncan Coal Co. and is operated by Peabody.

POWER—The "River Queen's" dependable direct-current drives supply constant, stepless power to hoist, swing and crowd this giant machine efficiently and economically. This power is demonstrated daily in its open-strip mining operation. The shovel gouges out rock and earth in 80-ton bites, swings the load 295 feet, dumps it in 100-foot piles, and then returns for another 55-cubic yard bite. The duty cycle is repeated again and again, 24 hours a day, every day of the year.

ONE MAN CONTROLS the movements of this huge machine. The fast response and precise speed control enables the operator to make one complete duty cycle in less than a minute!

D-C DRIVES CAN HELP YOU increase tonnage mined and speed operating cycles in your shovel operations. And, the rugged construction of adjustable-voltage direct-current shovel drives means reduced downtime and a minimum of maintenance.

Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania. 811-6

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GENERAL ELECTRIC

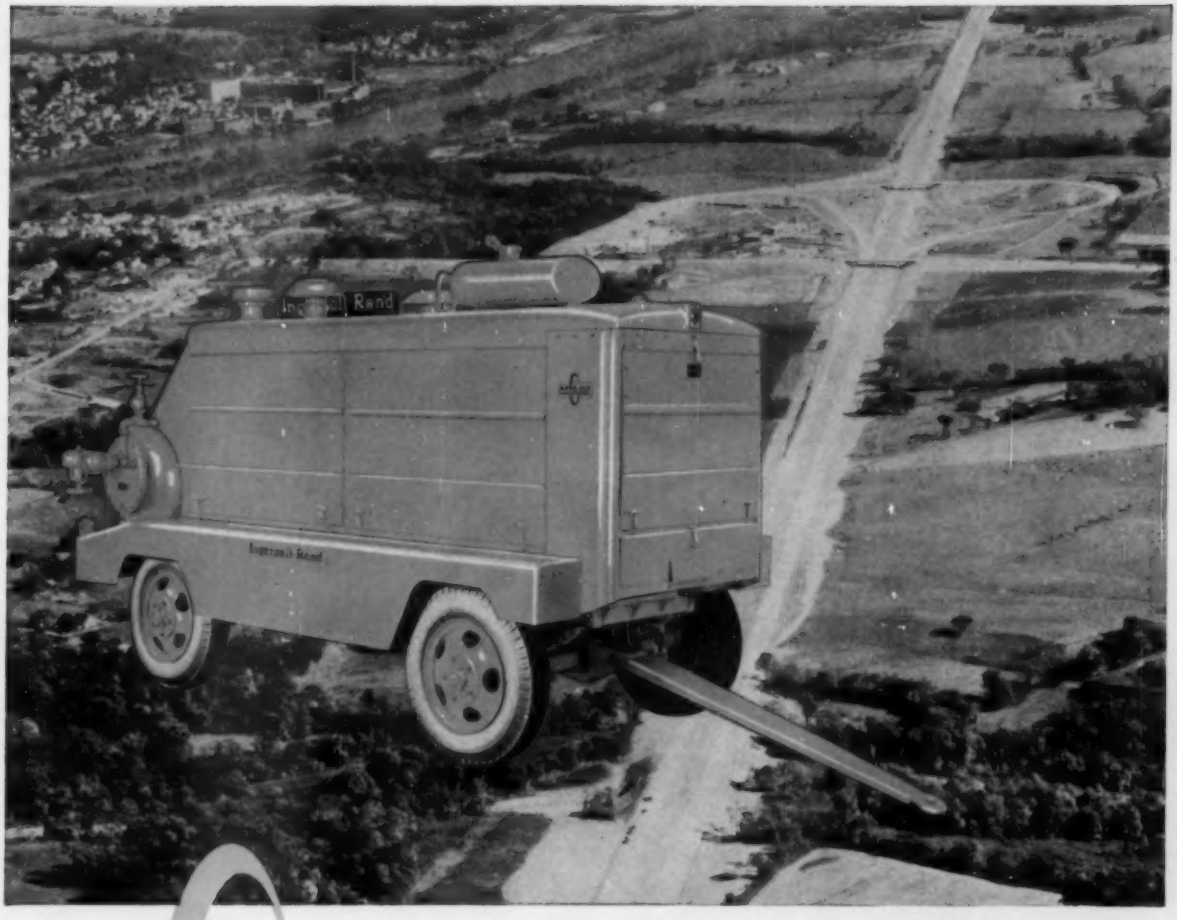
WIRE ROPE AT WORK

The Roy C. Smith Bridge over the Neponset River, near Milton, Massachusetts, is an important link in Greater Boston's expanding new system of expressways. Because of its high level, this streamlined bridge is the only Neponset River crossing between Milton and the Bay that is not subject to navigational openings.

Construction involved the placing of some heavy plate girders, and the photograph shows one of them being lowered into position. The girder is 106 ft long and weighs approximately 34 tons. Handling of the load was entrusted to strong, flexible Bethlehem wire rope, Purple Strand grade—a top-quality rope that makes even the touchiest jobs seem routine.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING



GYRO-FLO *the greatest of them all...*

PORTABLE ROTARY COMPRESSORS

Ever since 1902, Ingersoll-Rand has pioneered the outstanding developments in portable air compressors. Time after time these proved to be major steps in setting new standards of comparison. Each new model was acclaimed "the best ever" by users all over the world.

In 1950, when I-R introduced the Gyro-Flo — the first successful portable rotary compressor — it was the subject of much speculation and comment. Some thought that it would not stand up, others felt that this was the compressor they had dreamed of.

Today, although the Gyro-Flo is perhaps the most widely imitated compressor in history, it stands in a class by itself — unequaled in time-proven performance, dependability and low-cost maintenance.

The Gyro-Flo is available in six sizes — 85, 125, 210, 315, 600 and 900 cfm — the most complete line of portable rotary compressors in the world. And, certainly Gyro-Flo is the "greatest of them all."

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IR CONTRACTORS' COMBINATION

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THE BEST AIR EQUIPMENT FOR BETTER HIGHWAYS

Queen of the big shovels

55-CU.-YD. DIPPER makes a bulldozer look small. The Tiger Brand Wire Rope is 2⅝" in diameter.

THE RIVER QUEEN, largest shovel ever built by Bucyrus Erie. Now operating in the River Queen mine near Central City, Kentucky. The mine is owned jointly by W. G. Duncan Coal Co. and Peabody Coal Co. It is operated by Peabody.

can move 100,000 tons daily

with "muscles" of Tiger Brand Wire Rope

IN LESS THAN A MINUTE, the River Queen can scoop up an 80-ton bite of rock and earth, pile it 295 feet away and be ready for the next bite. That's fast digging!

The River Queen is the largest power shovel that Bucyrus Erie has ever built. It has a 55-cubic-yard dipper and is as high as a 13-story building.

The wire ropes that harness the tremendous power of the shovel are all U.S.S. American Tiger Brand. The two twin-reeved hoist ropes are 2⅝"-diameter, 6 x 49 Lang Lay Monitor Excellay with Independent Wire Rope Core. The two twin-reeved crowd ropes and the single twin-reeved backhaul rope are of the same size and construction.

The boom supports are eight in number for a total length of approximately 952 feet. These are 2½" Galvanized Boom Support Strands of special design for long service life.

The fact that all the wire rope applications on this huge shovel are handled by standard Tiger Brand constructions emphasizes the quality of the engineering that goes into the complete line of Tiger Brand Wire Rope.

THE BIG BOOM is 145 feet long and is supported by eight 2½" Tiger Brand Boom Supports. Note also the two twin-reeved hoist ropes in foreground.

AMERICAN STEEL & WIRE DIVISION
United States Steel, General Offices: Cleveland, Ohio

The right wire rope will do the trick!

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USS

USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

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Only Macks have Mack-built transmissions. They're the finest units made, manufactured to standards no other automotive maker approaches. There's one for every trucking requirement—from four- to twenty-speed. And all are built for almost unbelievable endurance under maximum loads.

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The exclusive, Mack-built, 20-speed Quadruplex, shown with gears and shafts.

HERE'S WHAT MAKES MACK TRANSMISSIONS THE WORLD'S FINEST

- To make sure that Mack transmissions are untouched for strength and endurance, the exclusive Mack tetrapoid gears are drop forged, generator cut and case hardened.
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- To hold maintenance and upkeep expenses to a minimum, Mack provides transmissions with pressure lubrication of bushed bearings and with magnetic plugs.
- To assure long-lasting, stress- and vibration-free operation, Mack transmissions are designed to work in harmony with all other Mack components.

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LISTING REPLACEMENTS PARTS FOR

EVERY MAKE AND MODEL DRAGLINE

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to exactly the right degree of abrasion-resistant hardness and shock-absorbing toughness.

A superior ESCO Cast 12M Cutting Edge that starts sharp, stays sharp and wears longer.

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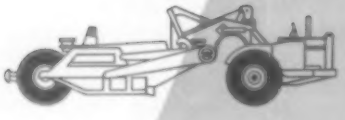
Now Available for Scrapers and Dozers



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ESCO Cast 12M Scraper and Dozer Cutting Edges last longer under every digging condition. Because of its high-strength, wear-resistance and shock-absorbing toughness, *ESCO* 12M increases cutting edge life, reduces down-time and keeps your equipment operating far more profitably on every job.

TEMPERED . . .
ESCO Cast 12M Cutting Edges are Oven-Tempered — that's why the same tough "edge-metal" extends all the way through; there is not just a thin shell of hard surface metal that soon wears away. *ESCO* Cast 12M Cutting Edges will actually outwear ordinary rolled steel blades 5 to 1, and *stop* blade breakage.

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ESCO Cast 12M Cutting Edges are Brinell Tested to assure you exactly the right combination of wear and shock resistance for longer blade life, fewer blade changes and more profit per job.

and TERRIFIC!

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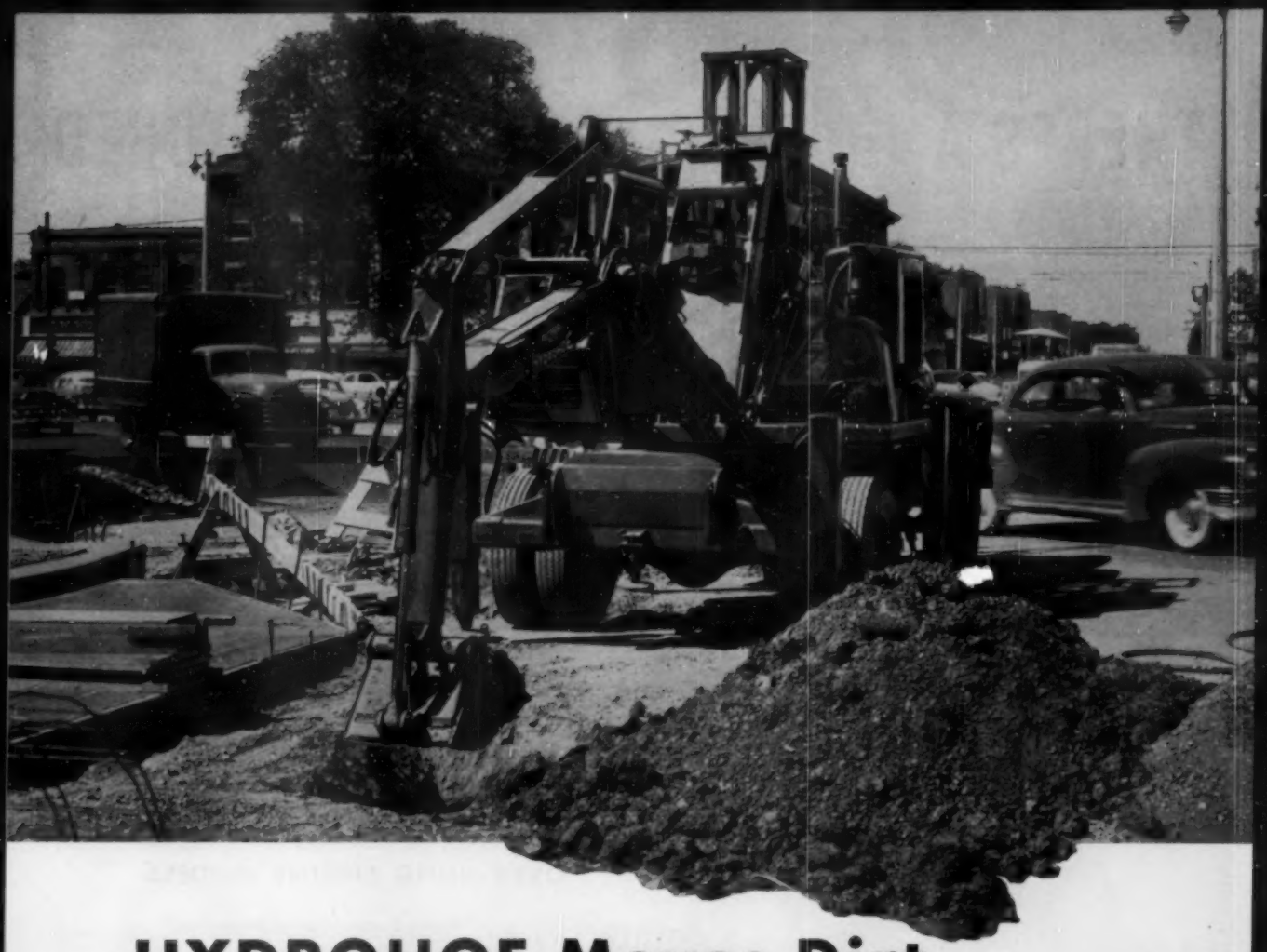


HYDROHOE Moves Dirt While Traffic Moves

Here's a hoe that trenches for water, gas or sewer lines, digs manholes or valve pits and handles most dirt-moving and lifting chores on busy city streets — *without* blocking traffic.

The all-hydraulic Hydrohoe supplies more digging and lifting capacity with less weight and in less space than ordinary machines. The Hydrohoe's extremely short tail swing and standard commercial truck mounting let it swing inside its own spread outriggers — work along curbs and gutters in little more space than a parked car.

The Hydrohoe's light truck mounting lets you travel through traffic at regular truck speeds . . . up to 50 mph on the open highway. Hydraulic outriggers that extend and set in seconds provide bedrock stability . . . take all working stresses off the truck.

A choice of dipper sizes and types gives you unsurpassed versatility. For example, the 20-in. utilities dipper rotates from 45 degrees behind the handle to 50 degrees ahead . . . lets you dig short, deep holes with a minimum of waste time and effort. A 60-in. wrist-action clean-out dipper is designed for cleaning and widening roadside ditches.

Put this fast, compact, all-hydraulic Hydrohoe on your jobs soon. Your nearby Bucyrus-Erie distributor will supply details. 173H57C

Bucyrus-Erie Company South Milwaukee, Wisconsin

THERE'S A "Euc" SCRAPER MATCHED

3 TYPES

Euclid offers you the most complete line of self-powered scrapers in the industry—and they're all job-proved to give you more work-ability and low cost yardage. No matter what your job may be—from small clean-up or grading work to big yardage projects—there's a size and type that meets your requirements.

SIX-WHEEL SCRAPERS

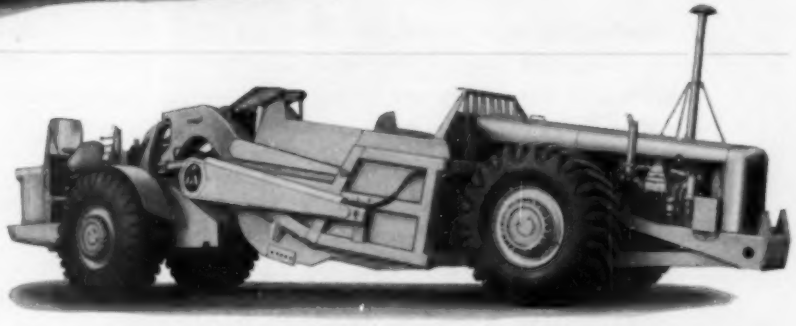
These models provide maximum stability for long, high speed hauls. They have capacities of 12, 18 and 24 yds. struck . . . are powered by engines of 200 to 335 h.p. and haul heaped loads of 16, 25 and 32 yds. at speeds up to 30 mph.

OVER-HUNG ENGINE MODELS

Payload capacities of these "Eucs" are 7, 12 and 18 yds. struck . . . 9, 16 and 25 yds. heaped. Over-hung engine design of tractors provides excellent maneuverability and ease of handling in difficult work . . . engines are 143, 300 and 335 h.p.

TWIN-POWER SCRAPER

With a total of 518 h.p., this Euclid has a struck capacity of 24 yds. . . . 32 yds. heaped. Two engines, each having a separate Torqmatic Drive, enable this "Euc" to work independent of other equipment and move more yards at lowest cost on any scraper job.



Your Euclid dealer can supply performance and cost data on the Euclid Scrapers best suited to your operations. Have him show you why Euclids are your best investment.

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

TO ANY SIZE OR KIND OF JOB

7 MODELS job proved and available now!

S-7 Model S-7 is equipped with 143 h.p. engine . . . 18.00 x 25 tires . . . 4-speed Torqmatic Drive . . . full hydraulic 90° steering. Capacity is 7 cu. yds. struck and 9 yds. heaped at 1:1 slope. Optional tires are 21.00 x 25.

S-12 Powered by a 218 h.p. engine, the Euclid S-12 Scraper has a 5-speed transmission . . . 24.00 x 25 tires . . . full hydraulic 90° steering. Struck capacity is 12 cu. yds. . . . at 1:1 heap, 16 yds.

S-18 This Model S-18 has a 300 h.p. engine with 4-speed Torqmatic Drive. Struck capacity is 18 cu. yds. . . . 25 yds. at 1:1 heap. Tires are 27.00 x 33 with 33.50 x 33 optional . . . full hydraulic 90° steering.

FDT This 4-wheel tractor model has a struck capacity of 12 cu. yds. . . . 16 yds. heaped . . . and is available with 200 or 218 h.p. engine and 5-speed transmission. Tire sizes are 12.00x25 front and 21.00x25 on drive and scraper wheels with 24.00x25 optional.

SS-18 The Model SS-18 has a 300 h.p. engine and 3-speed Torqmatic Drive. Capacity is 18 cu. yds. struck and 25 yds. heaped. Front tires are 14.00 x 25 . . . 24.00 x 25 tires on drive and scraper wheels with 29.5 x 25 optional . . . hydraulic booster steering.

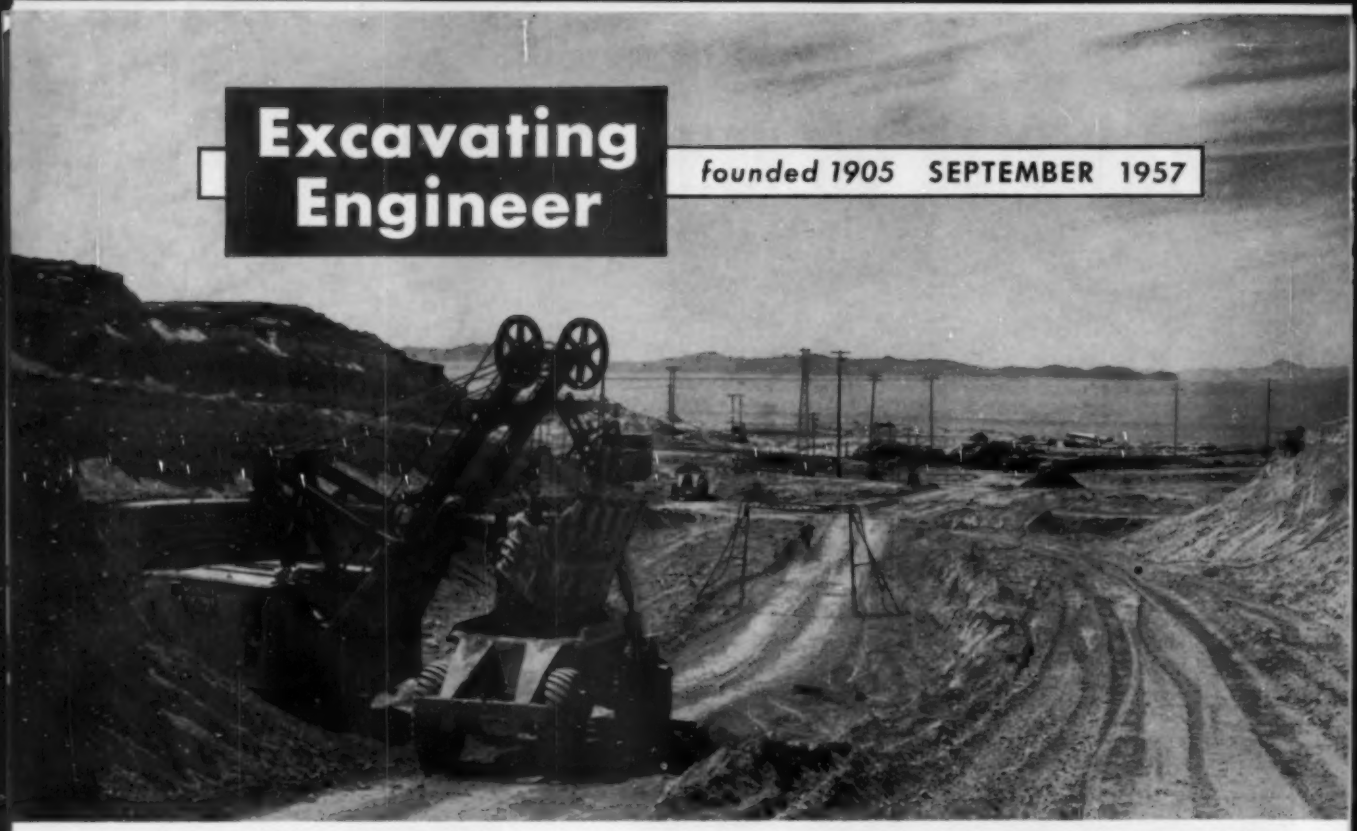
SS-24 A 300 or 335 h.p. engine with Allison 4-speed transmission and converter lock-up powers the Model SS-24. Struck capacity is 24 cu. yds. . . . 32 yds. heaped. Front tires are 14.00 x 25 . . . drive and scraper tires are 27.00 x 33 with 33.50 x 33 optional for maximum traction and flotation.

TS-24 The Model TS-24 has a 300 h.p. engine for the tractor and a 218 h.p. engine for the scraper . . . each with a separate Torqmatic Drive. Heaped capacity at 1:1 is 32 cu. yds. . . . 24 yds. struck. Full 90° hydraulic steering . . . 27.00 x 33 tires with 33.50 x 33 optional.

"Euc" Scrapers have hydraulic lever action, 4 section adjustable and reversible cutting edges, unequalled accessibility and other cost-cutting advantages. Check the complete Euclid line before you decide on any scraper equipment.

Excavating Engineer

founded 1905 SEPTEMBER 1957



Electric shovels with 8-yd. dippers quickly slice down huge banks of sand and gravel for loading into 25-yd. Euc No. 23-LDT's.

Huge Fill Spans Great Salt Lake

by Ray Day

MAN'S most ambitious use of earthfill in the intermountain West is under way on Great Salt Lake, Utah.

Under a whopping-big $45 million contract with Southern Pacific Railroad Co., Morrison-Knudsen, Inc., has begun construction of a 32 million-yd., 13-mile earth and rock barrier which will span Great Salt Lake from Promontory Point on the northeast shore to Lakeside, on the southwest shore. The Boise (Idaho) construction firm's schedule calls for the excavation and placement of 1,200,000 cubic yards of earth and rock fill a month.

When M-K moved in, the job site wasn't much different from Golden Spike days, back in the last century. A townsite had to be built from scratch. Some $15 million worth of equipment had to be arranged for, mostly by buying it new. And a complete marine fleet had to be assembled to take care of

Panoramic view of M-K camp at Promontory Point shows harbor (left), repair area (center) and shops and homes (right).

overwater work. That was unusual for an excavating job.

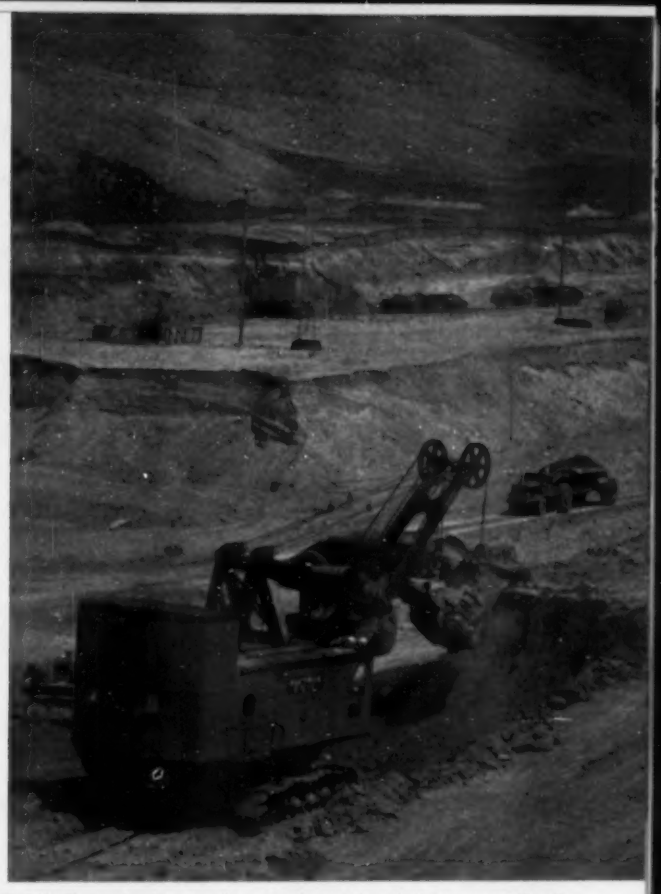
For both M-K and Southern Pacific, the job had plenty of unknowns. To reduce them to a minimum before construction began, Southern Pacific engaged some of the best experts in the nation. For example, exactly how much load would the two principal types of Great Salt Lake bottom material support? What was the best crossing site from a standpoint of economics? Dogging M-K were such problems as selection of the right kind of equipment, buildup of a large construction force in a labor-scarce area where turnover is high, the remoteness of the project, and unknowns in the work. For example, nobody knew what would happen to a bargeload of rock buffeted by waves weighing one and a half times as much as ordinary water because of their salt content.

The railroad company needed this crossing badly. When the railroad first was built in the 1800's, it curved around the north arm of Great Salt Lake and connected with a direct overland link not far from Wendover, at the Utah-Nevada border. In 1904, in an effort to save miles on the Ogden-San Francisco route, the original overland portion along the north arm was abandoned in favor of a wood pile trestle, driven 13 miles across the lake at a site close to the present fill. That trestle has served long and well, but railroad company officials realized that maintenance was skyrocketing. Too, the threat of sabotage in wartime was very real. Even an ordinary type of accident put the crossing out of commission. For example, high wind and discarded fiery waste from a hotbox burned out 600 feet of the trestle two years ago. Rail traffic was rerouted until the trestle could be rebuilt.

Investment in a new earthfill crossing was considered several years ago, and

32 million-yd. railroad crossing, 13 miles long, requires tremendous outlay of big equipment.

Fully loaded, a 3,200-ton bottom-dump barge heads out into deep water in Great Salt Lake towed by a 1,000-hp diesel tug. Six hopper barges, five flat-decks are used.



(Left) Paydirt drops from 8-yd. Esco dipper into waiting Euclid. (Right) Three electric loaders are teamed up in borrow pit No. 1.

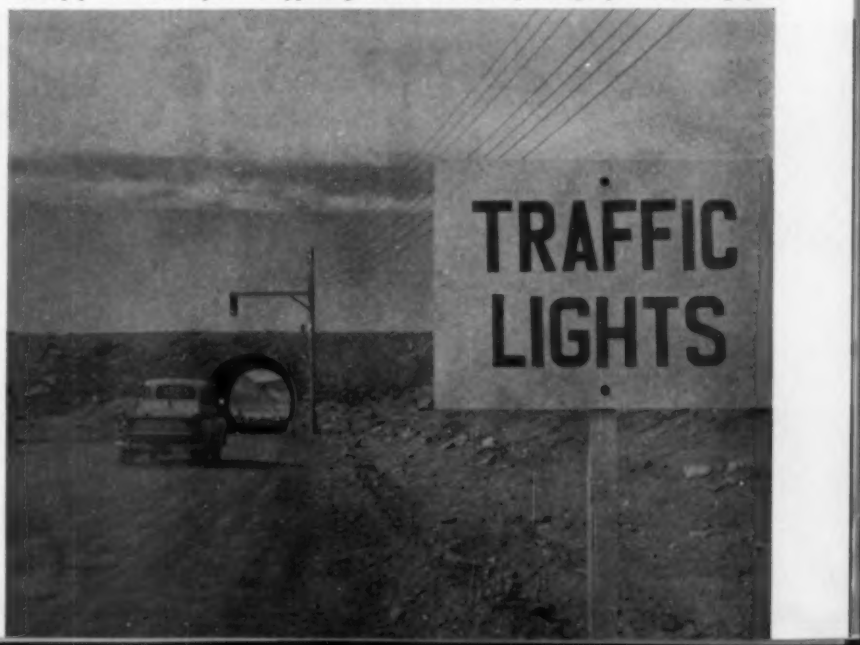
extensive preliminary surveys and foundation investigations were made. From a standpoint of economics, the best possible crossing site was one parallel to, and only a few hundred feet away from the old trestle. Foundation investigations showed two principal types of material in the lake bottom. Best bearing-value material was a formation of Glauber's salt—hard and firm. There was about six miles of this material. Over the remainder of the lake, the bottom was a much poorer clay material. An average of from 20 to 25 feet of soft muddy ooze overburden lay over clay and salt alike. It would have to be removed by dredging prior to the start of the earth and rock fill.

Embankment Design

Because of differences in foundation bearing qualities, the cross section of the fill varies from a wide, gently sloping embankment over the clay bottom to a sharper rising, narrower section on Glauber's salt. Generally speaking, the bottom width of the embankment will range from 175 to 480 feet, the fill will have a total height of from 70 to 80 feet (maximum water depth is about 60 feet), and the embankment crest will be 38 feet wide to accommodate a double set of railroad tracks. Design of the embankment reverses ordinary procedure in that the base of the fill will be sand and gravel, instead of large rock. There will be approximately 16 million cubic yards of this material. Above the sand and gravel fill will be about 15 million cubic yards of quarry-run rock. The embankment faces, exposed to wave action, will be protected by derrick stone in pieces weighing from one to three tons each. Normal water surface of Great Salt Lake is 4,202 feet above sea level. The final embankment will be at elevation 4,220.

M-K organized the project for optimum production costwise. In setting up equipment and methods, M-K's plan called for bottom dumping the rock, sand and gravel fill to an elevation of

Important safety features in borrow pit areas include big-city traffic lights. Armco steel pipe tunnels separate opposing traffic routes, speeding up the hauling job.



minus 10, working directly over a trench dredged by one 15 and one 18-in. hydraulic dredges. From elevation minus ten to plus three, construction of the fill is of material delivered by deck-barge. This earth and rock is shoved off by dozers, or by barge-mounted dragline—the dragline working from a nearby barge. Truck hauling and end-dumping methods will then finish the embankment out to final elevation. Combined with this is a second operation at the Lakeside terminus, where a train-hauling method of dumping is being used.

Four principal material supply sites were picked. On the Lakeside shore, quarry facilities were set up. At Promontory Point, there are three material supply sources. Borrow area No. 2, one of these sources, will supply the sand and gravel fill. It lies in a natural valley between mountain ridges, and is approximately two miles from the lake shore. Quarry No. 2, a source of large rock, is on the lake shore near camp. Quarry No. 1, another source of rock supply, is farther down the lake to the east, not far from the existing S-P railroad trestle.

The nine-month preliminary get-ready program included construction of loading docks along the lake front, dredging of a harbor and turning basin to serve these docks, and dredging of an approach channel connecting the deepened harbor, with deeper water about 2⅔ miles offshore. A sizable shipyard was necessary, to build six 3,200-ton capacity hopper-type dump barges, and five 2,000-ton flat-top deck barges. Six tugs of 1,000 hp each and two tugs of 600 hp each also were assembled and launched there.

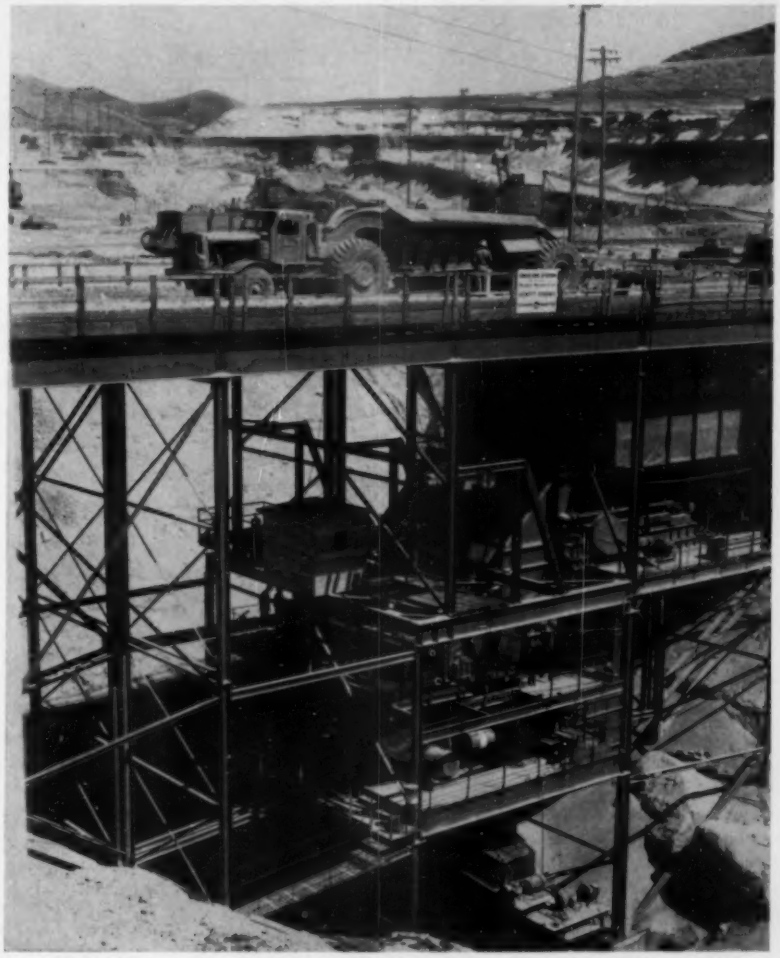
Self-energizing Conveyors

What is reported to be the world's fastest conveyor system for transporting rock, sand and gravel had to be designed and built. Although its construction called for an investment of $2 million, it was decided that a conveyor system would be the most economical method of transporting sand and gravel from borrow pit No. 2, over the two-mile distance between the pit and the lake shore. The contract for furnishing the equipment was awarded to Hewitt-Robins Co., Passaic, N. J.

Hewitt-Robins considered several alternates, one calling for a beeline route up over the top of a mountain ridge and down to the lake shore. That would have called, however, for a 1,000-hp motor on the first conveyor run. A much more economical route lay over a little longer distance at a lower elevation, where smaller and less expensive motors could be used.

In working out the details of this installation, Hewitt-Robins investigated installations in France and Germany, where coal was being moved on conveyors at the then unheard rate of 850 feet per minute. There was no reason why heavier sand, gravel and broken rock couldn't be moved at the same rate of speed in the United States, they concluded. Their system at Promontory Point was designed around that assumption.

The system has been designed so that there could be multiple truck-dumping points in borrow pit No. 2. Conveyor



Conveyor feeder hopper carries: two hoppers where Eucs can dump; Hewitt-Robins Oro feeders; a pair of Hewitt-Robins screens; and two Pioneer 36 x 42 jaw crushers.

run No. 6, which will be in the ultimate portion of the system, will be a 200-ft. long run of 54-in. belt. Conveyor No. 5, which is also yet to be installed, will be 2,000 feet long and also 54 inches wide. The conveyor system in use when *Excavating Engineer* visited the project started with conveyor 4-B—an accelerating unit only 30 feet long, but 60 inches wide. Purpose of this conveyor is to give material motion before it drops on the next run.

veyors approximately 500 feet long, operating at 550 fpm. Each is powered by a 300-hp electric motor. Each of these big loading conveyors will handle 6,000 tons per hour, delivering a total combined peak capacity of 12,000 tph. Capacity like this means that a 3,000-ton dump barge can be loaded in 15 minutes if feed piles come through the gates evenly without "ratholing".

This futuristic conveyor system has a number of unique points. Chief among

through the take up, thus saving investment cost in extra belt plies.

Another advantage of this method is that the operator has complete control of the conveyor belt at all times. The Petterson method is patented by Hewitt-Robins.

Designed to handle material weighing 100 pounds per cubic foot, the system is handling material nicely which sometimes goes as high as 130 pounds per cubic foot. The conveyor also was de-

A 54-in. five-ply Hewitt-Robins conveyor belt, 4,200 feet long, leads to the harbor from borrow pit No. 1. It carries 4,200 tph.

Conveyor 4-B dumps to conveyor No. 4, a 54-in. wide five-ply Hewitt-Robins belt, 4,200 feet long. Like other conveyors in the system, this one is self-energizing, generating at times up to 300 hp. Normally, it operates at 850 fpm, dropping to 800 fpm when driving.

No. 3 conveyor run is a 3,360-ft. length of 54-in. five-ply belting. There is a transfer tower and accelerating conveyor between No. 3 and No. 4. No. 3 conveyor is designed to operate at 820 fpm, and is pitched downgrade practically all the way.

These delivery conveyors dump with the aid of a radial stacking arm, which stacks the material over two large recovery tunnels in which 10 tunnel belt feeders are located. The belt feeders, in turn, supply the other part of the system. These include two 72-in. con-

these is the Petterson method of driving the separate runs, which eliminates completely any driving through the take-up end of the system.

Belt Drive System

The Petterson system consists of two main drive pulleys, one on each side of the take up. These two drive pulleys are geared to pinions on a common countershaft. The pinions are mounted on overriding clutches, which set opposite hand to each other. When the motor drives, one, and only one, clutch can engage so long as the motor speed is subsynchronous.

When the belt drives the motor, the motor speed must be super-synchronous. Then, and only then, the second clutch engages. At the same time, the first clutch disengages. This makes it possible always to avoid driving the belt

signed to record automatically the weight of material handled on the line, using a pneumatic-electronic recording weigh scale manufactured by Industrial Physics and Electronics Co., Salt Lake City. Since the job will last through 1960, this big conveyor installation will also offer an excellent opportunity to do horsepower research and to check many of the things conveyor people debate over. These include energy requirements for idler friction; force required to overcome idler jump of the belt at high speed; force requirements made necessary because of friction between material particles on the belt. It has already become apparent that quite a bit of power in a conveyor system is lost because material wiggles and slides as the individual particles work against each other.

Borrow area No. 2, where sand and

At the dock twin conveyors load a flat-deck barge. A Cat D8 dozer and a Michigan 175-A tractor-shovel will dump the load.

gravel fill for the bottom of the embankment is being produced, is largely a high-speed bailing shovel operation. To serve this area, M-K purchased three Bucyrus-Erie 150-B shovels and equipped them with 8-yd. Esco dippers. Electrically-powered, these big machines can load the material at high speed—up to 10,000 tons per machine in eight hours. Hauling units from the 150-B's include eleven 25-yd. bottom-dump Euclid No. 23-LDT's.

Roaring out from the 150-B's on well-maintained haul roads, the Eucs dump into a pair of 60-yd. hoppers mounted at the top of a tall feeder tower at the start of the conveyor system. Each hopper will hold two full loads from the belly dumps. Between the dump point and the conveyor system, the material is handled by a Hewitt-Robins apron-type Oro feeder 60 inches wide. These feeders are driven by 20-hp Varidrive motors through Jones speed reducers, developing plate speeds up to 36.3 fpm. The feeders drop the material over a pair of Hewitt-Robins 6 x 14-ft. scalping screens, whose 8-in. opening scalps off all oversize material and passes the remaining fraction down to the accelerator conveyor, at the start of the system. All oversize material—and this sometimes reaches as high as 13%—passes through a pair of Pioneer 36 x 42 jaw crushers, which break oversize boulders down to meet specifications. This material also then drops to the accelerating conveyor.

Since the full 4,200-tph capacity of the conveyor system has been reached on many occasions, it means that the three 150-B shovels and their hauling units have often had to move 10,000 tons a shift per shovel.

The eventual disposal of material from borrow pit No. 2 is by way of a water route from a dock-loading point at the end of the stacker conveyor. Bottom-dump barges are loaded with 3,200 tons of this material, and are towed out to the dumping site by a fleet of eight tugs powered by 1,000-hp and 600-hp Enterprise diesels. Two hydraulic dredges —the *Hood* and the *Judah*—have worked ahead to cut a dumping trench, which exposes foundation material on which the embankment rests. Dumping of the loaded scows is under control of

Dumping of loaded scows is under control of an engineer. Survey towers are positioned along the embankment and a string of dump targets is set above the water.

Continued on page 62

Maintenance of costly equipment in remote area is a gigantic problem for M-K. Northwest 80-D dragline above loads fill.

Maintaining a $15 Million Spread

When equipment costs one-third of the total contract price, and has a four-year job to finish, topnotch preventive maintenance is vital. Great Salt Lake contractor shows how it's done.

by Ray Day

YOU can keep today's construction equipment on the line, continually working at peak capacity, only if you insist on proper maintenance.

Morrison-Knudsen Co., Inc., is demonstrating the truth of that statement on one of the nation's biggest construction projects, the $45 million Great Salt Lake crossing, near Ogden, Utah. A $15 million spread of equipment is being maintained on the big railroad embankment project so that the machines will be working as productively and efficiently four years from now as they did when they were new. It's not easy. For example, how do you keep 70 diesel engines humming in an area where engine technicians are scarce? To Master Mechanic Elmer Riggan, that was a very real problem—one he solved only by training an engine crew from scratch.

According to the M-K executive supervisors who have had a year now to try the equipment, the intelligent answer to preventive maintenance is a combination of: 1) wise purchasing of good machinery in the first place; 2) full cooperation between operators and mechanics; 3) prompt, regular inspections to head off mechanical failure before it begins; and 4) prompt, thorough maintenance and repair done exactly the way the manufacturer of that equipment recommends.

A maintenance policy based on those four fundamentals is being followed on the Salt Lake Crossing project. From all appearances, it is paying dividends in production. What's

Jack Holland (left) of Holland Equipment Co. shows Elmer Riggan a new style coupling for hydraulic lines. Listening to salesmen is a regular part of Riggan's day.

happening on the Utah job isn't unique for M-K; it's typical of the entire company policy from Boise on down. Long ago M-K found how closely inter-related equipment maintenance and dollar-making production really are. Profit on a construction job these days just doesn't happen unless equipment stays on the production line working at peak or near-peak capacity. And equipment can't work unless it's maintained.

Cable splicing facilities with full-time personnel are important to maintenance setup. Splicer is installing a zinc socket on a large-diameter dump cable for a hopper barge.

Earthmoving Fleet

The size of the equipment spread on this job is huge; so is the $15 million investment spent in gathering the big fleet of machinery together. For example, there are six Bucyrus-Erie 150-B shovels. There's a 3-yd. Bucyrus-Erie 71-B machine which is currently working as a crane, but slated for dragline use later on. Two American stiffleg derricks squat, workwise, on the waterfront service dock. There are 15 end-dump 63-TD Euclids, whose engines now have approximately 3,000 hours of service. Along with those are eleven 25-LDT's, huge belly-dump monsters whose engines now have over 1,500 hours of service. There are two Northwest 80-D draglines, 11 Cat D8's, a Michigan 175-A tractor shovel, and a host of drills and smaller equipment.

Besides all that land equipment, there's a complete marine fleet to maintain in topnotch condition. And that's doubly important, because the marine fleet is an integral part of the setup. When marine equipment can't work, shore-based machinery must slow down or stop. Marine equipment includes the hydraulic cutterhead dredge *Hood*, whose power consists of a General Motors Series 6-71 quad, a GM 6-71 engine on the pump shaft, and two 6-110 General Motors diesel-electric generator sets. The 18-in. dredge *Judah* has two sets of General Motors 6-110 diesels (in twin mounting) on her pump, and has two GM 6-71's for her generating equipment.

There are six large 1,000-hp tugs and

Spools of cable, neatly stored, make it easy to select and cut proper lengths of wire rope for various pieces of equipment.

Abrasoweld beads, welded on by mechanics, protect this dozer blade from wear caused by working in abrasive rock.

two 600-hp tugs with Enterprise diesel engines; six big bottom-dump 3,200-ton hopper-type barges; and five 2,000-ton flat-deck barges. All require regular, careful maintenance.

An equipment spread of that scope is impossible to maintain on any hit-or-miss schedule. The crew, therefore, has been carefully screened during the first year, regardless of turnover, to get a group of men devoted to the proper upkeep of topnotch machinery.

M-K spared no expense in setting up the kind of facilities which permit men to do a good repair job. In a central area there is a big five-bay machine shop complete in every respect, a paint shop, welding shop, cable-splicing yard, storage yard and steam-cleaning facilities. The machine shop has a $42,000 LeBlond lathe with a 42-in. throw; a number of smaller lathes for specialty work; a new radial drill press; milling machine and shaper. The shop area is served by a 7½-ton electric overhead crane.

There are specialty shops inside this huge headquarters. For example, there's an electrical shop where delicate repair and maintenance work is done, and an injector room where those vital parts of diesel engines are serviced and repaired. Riggan has 31 electric welding machines available. These are divided about equally between Lincoln and Hobart makes. The mobile service truck is a Lincoln Lubrovan; in addition, a four-wheel service trailer, equipped with lubricants and some fuel, is stationed permanently in the easternmost quarry. All lubrication for this project has been standardized around Standard Oil products, so that one supplier can make regular inspections and keep the stock up to date.

There is also plenty of small auxiliary equipment around the yard to handle parts and supplies. An Allis-Chalmers tractor, with a Hyster boom, handles much of this material.

A combination of new and old preventive maintenance methods is in use. The old methods are those which have been tried and proved under long service. For example, one of the preventive maintenance policies is to run all tractors through the shop every week if possible, or every two weeks at the maximum. This permits the machines to be cleaned, inspected and run through the complete Caterpillar preventive maintenance inspection, service and repair program outlined in that company's literature. All maintenance is aimed at giving each piece of equipment exactly the detailed service which its manufacturer recommends. It's an aim that's paid off. If there are occasional deviations in method, it's only because empirical experience has proved beyond a doubt that something else is better.

Shovel Maintenance

The Bucyrus-Erie 150-B shovels have given very little trouble beyond their routine service. The man in charge of maintaining this equipment was a trained operator on the 150-B shovel. He decided it was more satisfying to keep the big machines in topnotch condition than it was to operate them.

Routine welding on dipper sides and lips has been necessary, as well as hardface buildup on Esco teeth and adapters, but wearing ability has been above par for this type of digging. On most dipper hardfacing a "dot" system of welding is being used, depositing the hardface rod in small round areas rather than as

Lathes in the machine shop turn out many a hard-to-get part. Shop includes one lathe with a 42-in. throw; smaller lathes; a radial drill press; milling machine; and shaper.

M-K has erected numerous steel buildings to house its maintenance setup. Main shop above has multiple bays and is served by a full-travel 7½-ton overhead crane.

full beads running completely across a member. A considerable amount of experimenting is under way with hard-facing, using Ranite B, Stoody rods of various types, and Abrasoweld.

Determining the right time to change engine oil is still a considerable problem, even for a company as experienced as this one. On the General Motors engines on dredges, where the workload is great, engine oil and filters are changed once a week. Tugboats, which have a somewhat easier workload, now have their engine oil changed at 500 hours. But some study and research is under way in an attempt to lengthen the engine oil and filter life to 1,000 hours if possible. AC filters are being used in these engines.

In every piece of equipment which receives hard service, there is a convenient form-pad handy so that the operator can jot down anything which seems to be going wrong. Then, when regular mechanics and supervisors go over the equipment, it can be checked out and corrected if necessary. Sunday is one of the busiest days in the week for equipment maintenance men. If any major repairs are necessary, these can be made on the day when the equipment is down. Each shift boss on the production line also watches all equipment under his supervision in a manner that's cooperative with the mechanical department. The idea is to keep machinery in topnotch working order on the production line, where it belongs.

Tires are a big item in anyone's maintenance program, and it's no exception here. Again, to centralize that maintenance program under one head, a subcontract has been given to Goodyear Tire Co. of Salt Lake City. Goodyear has trained men on the job for making inspections, hoist trucks for removing large earthmover tires and facilities for making minor repairs. Major work is done in Goodyear's main shops.

One of the most important single equipment maintenance items on this project is the upkeep of the huge $2 million two-mile Hewitt-Robins conveyor system which stretches between borrow pits and the loading dock on Great Salt Lake. Maintenance of this conveyor is important for a number of reasons, in addition to the investment represented. The conveyor is absolutely vital to sustained daily production. The operation of this conveyor line directly affects the productive performance of many auxiliary pieces of equipment, such as the electric shovels, the fleet of Euclid bottom-dump trucks and the tug and barge fleet. Further to complicate maintenance on this line, it is one of the fastest moving conveyors in the world handling material as heavy as sand and gravel. Operating at speeds of 850 fpm with heavy loads, damage can happen fantastically fast. So M-K has put conveyor maintenance high on the list of important things never to be overlooked.

One of the important things in preventing damage to a conveyor the size of this one is to inspect the line carefully when it's first installed, so that all back spillage is eliminated completely at the loading points. Back spillage lets rock and boulders bounce down on a walkway and back in on the return line . . . and heaven help the conveyor belt which gets a rock wedged between the belt and the tail pulley. The remedy is

Dock conveyor equipment works around-the-clock loading barges. Schedule calls for excavation and placement of 1,200,000 cubic yards of earth and rock fill a month.

A small crawler tractor carrying a Hyster hydraulic crane boom loads steel bitts used on barges onto a truck.

to put scrapers on return belts in any case, so that no matter how a rock gets on the return line, it will be scraped off and removed before it gets back into the tail pulley.

Conveyor belts also wear out when their sides rub against steel, either in the idler frame, or against a steel member which has been welded in to hang something on the conveyor frame. It's a regular part of preventive maintenance on the Salt Lake job to check the sides of the belt carefully each day, and to make certain that they never rub against protruding steel.

Idlers themselves don't require much maintenance. They come factory-sealed with lubricant, and require greasing only once every six months.

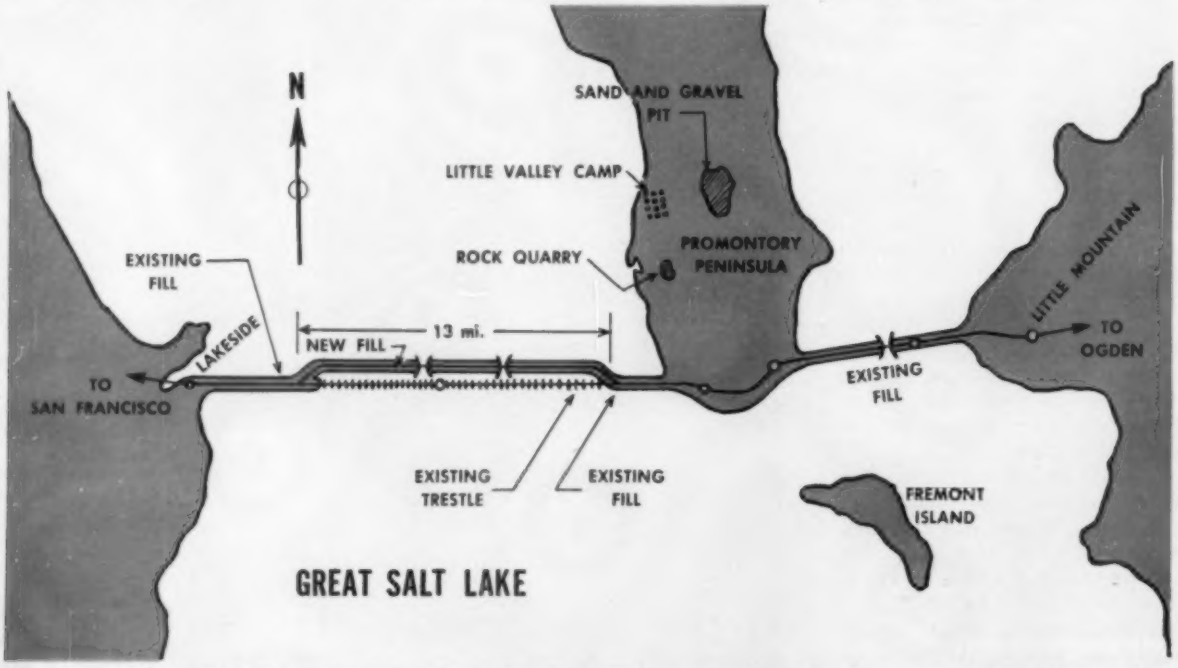
Splice Belts

The Minet splice, manufactured by General Splice Corp., New York, N. Y., has proved to be a good maintenance item. It is a hinged-type affair with plates sufficiently close together to minimize leakage. The splice is applied by driving copper rivets through the belt and peening the opposite side. A splice can be placed on the 54-in. belt in approximately one hour—considerably shorter than the usual time requirement for a belt that size. The device is used only on short-length belts.

After considerable experimenting, all scrapers on belts have been equipped with 90 durometer rubber, with the scrapers set at an angle of approximately 18°. They do a fair job of cleaning at that setting; at a greater angle they tend to chatter.

But no cleaner, however good, can replace the regular checking of every conveyor run to make sure there are no points anywhere along the line where rock can spill over and bounce back. Another important preventive maintenance point is the thorough checking of all chutes which feed onto the conveyor line. Many a conveyor has been worn out prematurely because a piece of steel, crossed in a chute, permitted rock to bridge up between it and the conveyor, pressing down with terrific force to wear and ruin the belt.

M-K's entire program is thorough, well organized, adequately staffed, and thoroughly chronicled on daily reports so that it can be checked back on. It's a safe bet indeed that the equipment M-K brought in to create the 13-mile crossing of Great Salt Lake will finish the project and live again to work somewhere else in the future.



Map shows rail trestle to be replaced by fill. Equipment facilities and personnel housing are located at Little Valley.

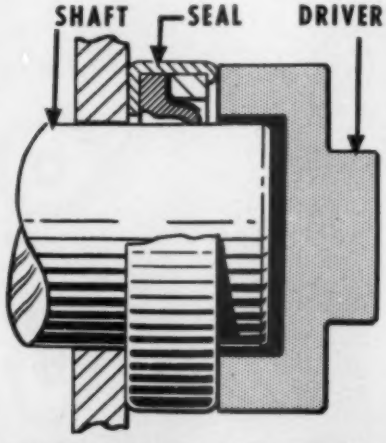
How to Install Tractor Seals

by J. B. Sinclair
Service Department
Caterpillar Tractor Co.,
Peoria, Ill.

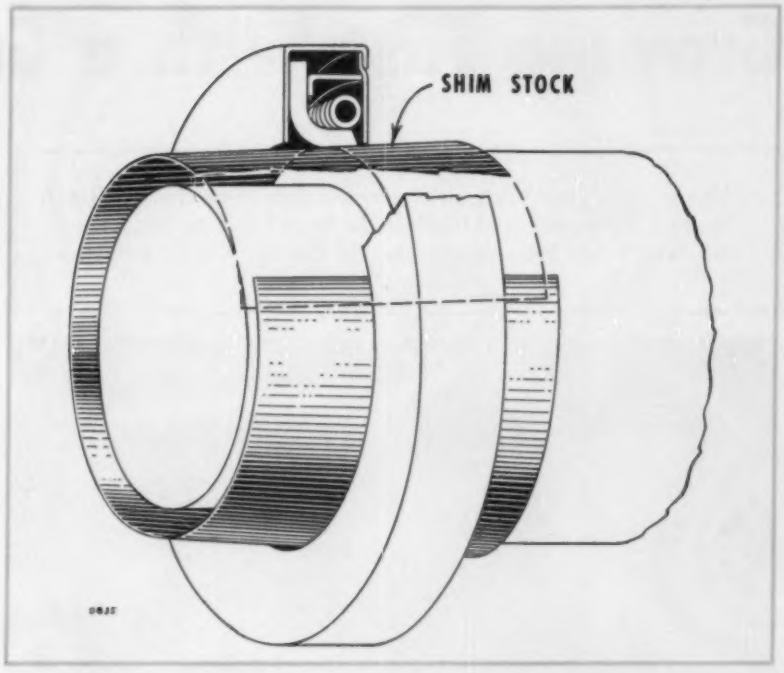
VERY frequently, the tractor parts doing a big job are small in size and, therefore, are seemingly insignificant. When compared to the size and cost of the crankshaft, the size and cost of the seal at the forward end of the crankshaft is negligible. Yet, that small seal, if not installed correctly or replaced shortly after a leak occurs, can permit serious damage to the engine.

A felt seal is ordinarily used where the principal requirement of the seal is preventing the entry of dust and the retention of oil or grease is not a requirement. When installing a felt seal, impregnate the seal with lubricating oil to protect the seal from overheating and wear. If the installation requires that the seal be split, the cut should be made at an angle.

Cork seals are sometimes used instead of felt seals. While cork seals give good protection at temperatures up to 150° F, they are not recommended in applications where they will be exposed to acids, alkalies or high pressure.



To drive a lip-type seal in place, a driving member that will press against the outside rim of the seal should be used.



If the seal to be installed must pass over a sharp shoulder, shim stock should be wrapped over the area and lubricated to provide a smooth sliding surface for lip.

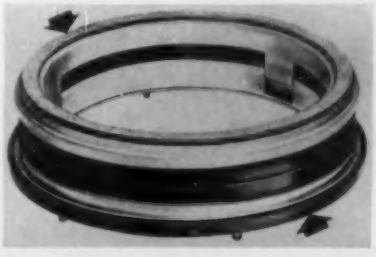
Cork, when used against a solid backing such as on face-type seals, effectively retains grease in a compartment and excludes water and dirt. When installing a face-type seal with a cork face, coat the cork face with graphite grease.

Widely-used Materials

Leather and rubber are widely used sealing materials. The most common usage is in lip-type seals. However, leather is being replaced by synthetic rubber in many of its applications. The rubber lip seal, in most applications provides better sealing at high speeds, high temperature and where misalignment and run-out conditions exist. Rubber lip-type seals are also effective dirt seals.

There are definite reasons why rubber seals have not replaced leather seals in all applications. Therefore, it is suggested that unless a rubber seal is recommended, the original leather lip seal should be used.

When possible, prior to installing a leather lip seal, soak it in warm oil for about a half hour. A rubber lip seal should just be dipped in oil. Install the seal with the wiping edge turned in the direction recommended. For single lip seals, leather or rubber, it is a general rule that the lip of the seal points toward the material to be sealed. That is, if the primary function of the seal is to exclude dirt from a compartment, the lip of the seal should be pointed toward the outside. If the primary function is to seal lubricant in a compartment, the lip of the seal should point toward the compartment containing lubricant. A double lip seal, whether



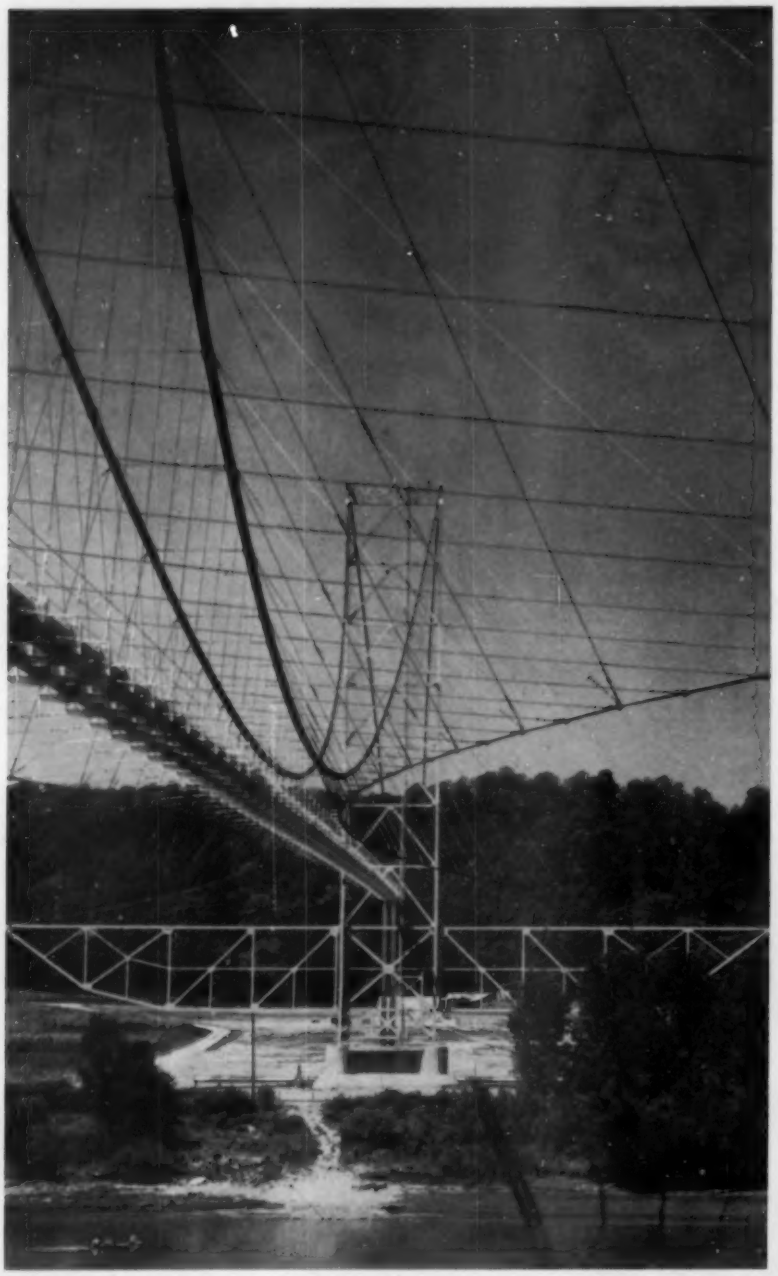
Top arrow shows an example of a cork seal; bottom arrow a Neoprene seal.

Continued on page 71

Seals play an important role in protecting the vital parts of earthmoving machinery. By following correct installation procedures, it is possible to prevent costly damage and downtime.

Growing Fast With a Growing City

Where there's some industrial construction to be done in Baton Rouge, La., the name of Nichols Construction Co., Inc., quickly comes to mind. Firm serves many of the city's large industries.



Amid the framework of cable and metal of a long suspension bridge across the Mississippi River at Grand Tower, Ill., are two gas pipelines which were erected by Nichols.

BATON ROUGE, an inland port located on the Mississippi River about 80 miles northwest of New Orleans, continues to grow at a rapid rate. Industrial building activity is brisk in and near Louisiana's capital city.

And, where there's some industrial construction to be done in Baton Rouge, one of the names that quickly comes to mind is Nichols Construction Co., Inc. Like Baton Rouge itself, Nichols Construction has expanded fast. Business has increased more than 15 times since Robert F. Nichols founded the company seven years ago. Today, Nichols Construction Co. is the largest industrial contracting firm with home offices in Baton Rouge.

"We serve most of the large industries in Baton Rouge," said curly-headed H. J. (Al) Alleman, Nichols' treasurer and office manager. "Most of our work is repeat business for the same clients."

Nichols started business as a pipeline contractor, with about 10 pieces of equipment, handling ditching through pipe installations and construction of pumping stations.

Today, with a payroll nucleus of 600 men that increases at peak activity to more than 800, Nichols Construction specializes in heavy industrial construction, although it still does some pipelining.

An important phase of the business is a contract equipment rental service. From its large equipment inventory,

Nichols will rent anything from a ¾-in. air drill up through 35-ton motor cranes and 2½-yd. diesel shovels.

"We're not primarily a rental outfit, nor a pipelining organization," Alleman said between telephone calls; "rather, we are a diversified construction company."

Diversified is the word. When *Excavating Engineer* visted Baton Rouge during a mild week last spring, Nichols Construction was working on about 50 different jobs. Among them were these:

1. A large chemical company, during an expansion project, had 40 of Nichols' men constructing a pilot plant.

2. Another 150 men were at work in a large petroleum refinery expanding a large, expensive process unit.

3. Working around the clock on another job, 50 men were using 24-in. I beams to install a track system over which two 600-ton furnaces would be skidded into place.

4. About 25 men were at Burnside, La., about 30 miles south of Baton Rouge on the Mississippi, where a large aluminum company had several pieces of Nichols' heavy equipment on rental for preparation of a new plant site.

5. A 1½-yd. Bucyrus-Erie 38-B dragline and a crew of men were assigned to another aluminum plant, this one in Baton Rouge, where Nichols was constructing a bauxite storage building and a subterranean conveyor system. The building, of steel and concrete, will be 80 x 400 feet.

6. Down near New Orleans, another 125 men were turning around a giant process unit in a petroleum refinery.

7. Another 25 of Nichols' men formed the maintenance crew at a Baton Rouge rubber company. They were engaged in such tasks as taking down cooling towers, installing pipe and changing pumps and furnaces.

8. A 1¼-yd. Northwest 6 dragline was on rental to another chemical company, which was constructing a new plant south of Baton Rouge on the Mississippi.

Diversified is the word, indeed! Like

Assigned to a plant construction project on a rental basis, this 2-yd. clam is casting mud aside while building a road where deck facilities are being constructed.

This 2½-yd. dragline excavates material ahead of a pile driver on a plant job.

A heaping load of material is dropped into a dump by a 1½-yd. dragline.

This 1½-yd. dragline and a crew of men are assigned to a Baton Rouge aluminum plant, where Nichols is constructing a bauxite storage building and conveyor system.

the two times in the last couple of years that Nichols erected gas pipelines on long suspension bridges. The first job was on two 30-in. lines which crossed a bridge over the Atchafalaya River at Melville, La. The next, believed to be the longest pipeline crossing of a river on a suspension bridge, was over the Mississippi River at Grand Tower, Ill. These two lines were under sub-contract from American Bridge. The line is owned by the Texas-Illinois Natural Gas Pipeline Co.

Grand Tower was the farthest Nichols Construction ever traveled from Baton Rouge to do a job. It tries to concentrate its business in the Gulf Coast area, with particular emphasis on the Baton Rouge and New Orleans territory.

Nichols had a large array of equipment at Burnside during construction of an aluminum plant in the shadow of the Mississippi levee. Included was a Bucyrus-Erie 38-B using a 2-yd. clamshell bucket to unload bauxite from railroad cars into stockpiles until the plant's facilities are completed next year.

Another Bucyrus-Erie rig, a 54-B with a 2-yd. clam, was casting mud aside while building a road where dock facilities were being constructed. A Lima 703 dragline with a 2½-yd. bucket was excavating dirt ahead of a pile driver, which was placing piles for a calcination building. Another Lima dragline, this one a Model 44 with a 1½-yd. bucket, was stockpiling river sand to build up low places.

Working on plant project, this bulldozer pushes spoil to the bank of the river in the dock area. Nichols Construction serves many of Baton Rouge's large industries.

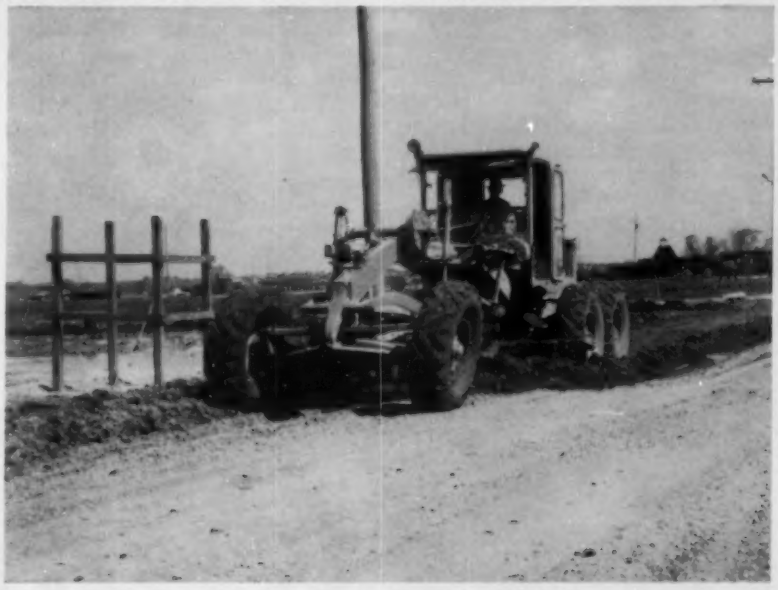
All but the 38-B were on rental to an Eastern contractor who held the prime contract for construction of the plant. Five of Nichols' Caterpillar bulldozers—a D9, three D8's and a D7—also were working at Burnside, as was one of the firm's Cat No. 12 motor graders.

Another of Nichols' crawler cranes, a Manitowoc 3000, was unloading coke for a chemical firm, and a 3500 Manitowoc crane was on rental in a nearby refinery.

Nichols' fleet of motor cranes is always busy, often on rental, according to

Bogged down in the riverside mud, a truck loaded with steel gets some help.

(Above) River sand is being stocked by this 1½-yd. dragline for use in filling low places on plant site. (Below) Haul roads are groomed at the site by this grader.

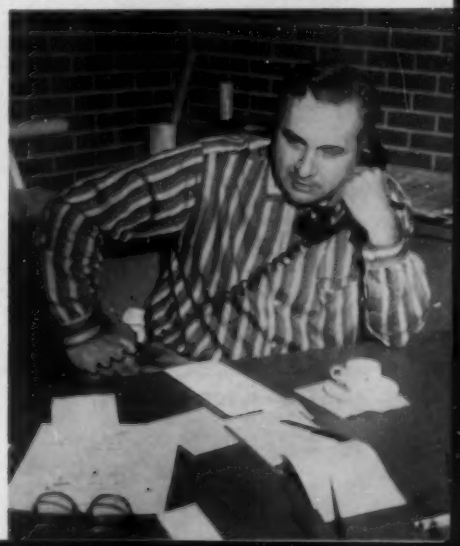


Alleman. These include five 30-ton Link-Belt HC-98's, a 25-ton Link-Belt HC-90, a Lima 54T, a 35-ton Bucyrus Erie 30-B and three Austin-Western hydraulic cranes. Also available are two Gradall excavators—one, on rubber and one on crawlers— and a "baby" crane, a four-wheel, rubber-tired Autocar.

A fleet of about 50 trucks includes Ford, Chevrolet, Dodge and Mack flat beds and winch trucks; 20 and 30-ton self-loading trucks; two Autocar tandems equipped with A-frames and winches; dumps; and pickups. Eight Caterpillar bulldozers are available, along with three Allis-Chalmers HD-5 front-end loaders, a 15-yd. LeTourneau scraper, six Cat DW15 rubber-tired

Continued on page 58

(Below left) A dump truck is washed at Nichols' Baton Rouge facility. (Below right) Robert F. Nichols founded the company seven years ago and has led its fast growth.



News from the Field

Homemade Blasting Mat

One method of controlling flying stone when blasting in residential areas was demonstrated recently by the water department of the city of Waukesha, Wis.

The department was laying water main along state route 18 in a heavily populated area when crews ran into ledge rock which required blasting.

To safeguard spectators and property, several dozen scrapped automobile tires were fastened together with a length of cable and placed over the charge by a backhoe. When the charge was set off, the pile of tires was raised up a few feet, but it held down the rock.

L. Russell Kelce Dies

L. Russell Kelce, who rose from the Kansas coal pits to head an industrial empire, died June 30 after an illness of more than a year. He was 59 years old.

L. Russell Kelce

Mr. Kelce was president of the Peabody Coal Co., Kansas City, Mo., which includes the Sinclair Coal group of companies. The Sinclair group was merged into Peabody in July 1955 to form a firm with assets of more than $100 million. Mr. Kelce was also board chairman of the Chicago Great Western Railway Co.

A fourth-generation coal miner, he went into the pits in Pittsburg, Kan., at 14 to help support the family after his father was injured in a mine blast. He never finished high school; yet, through ability, hard work and determination, he built one of the most spectacular careers in the coal industry.

After four years of work as a laborer, the ambitious youth won a coveted $225-a-month post as mine superintendent. World War I service at Camp Funston and Ft. Sill, Okla., followed. He emerged from the Army determined to get into mine ownership.

Mr. Kelce boldly borrowed $230,000 to work a coal lease near Tulsa, Okla., and paid off the loan in 18 months of successful operation.

It was in this venture that Mr. Kelce, still in his early twenties, met 31-year-old Grant Stauffer, operator of the small Sinclair Coal sales firm in Kansas City, who was to be his close associate for 25 years. With Stauffer as sales executive and Kelce as operating man, they joined forces and ultimately acquired a series of mines. In 1931, Mr. Kelce moved to Kansas City.

In 1949, when Stauffer died, Mr. Kelce succeeded him as president. Sinclair was then the seventh largest producer in the industry. The company and its 25 affiliates were closely held corporations, with the stock owned by officials and employees.

Sinclair Coal itself handled sales west of the Mississippi and the Southern Coal Co. Inc., Chicago, Ill., handled those in the East. The mines are in Illinois, Missouri, Oklahoma, Kansas, Iowa, Alabama, Kentucky and Indiana.

A major acquisition for Sinclair in

Continued on page 40

Automobile tires fastened together with cable were placed over an explosives charge by this ½-yd. backhoe to contain the blast.

DW15s BOOST PRODUCTION FOR STRUNK BROS., CATERPILLAR USERS FOR 18 YEARS!

Strunk Bros. of Tiskilwa, Illinois, started in business 18 years ago with Caterpillar-built equipment. The company has good reason for keeping its spread all Caterpillar. Here's why: these rugged yellow machines have meant money-making performance to Strunk Bros. And excellent service from the Caterpillar Dealer has kept the machines on the move.

On this job on Federal Aid Rt. 168, Putnam County, Strunk Bros. is using four DW15s with Scrapers, four D8 Tractors, one D7 Tractor and two No. 12 Motor Graders. The job involves 103,507 cu. yd. of earth excavation and 120,642 cu. yd. of borrow excavation. Owner Harry Strunk says CAT* machines boost production, are economical on fuel and have little down time.

Now a new DW15 (Series E) Tractor with new No. 428 LOWBOWL Scraper

No matter how good a job a machine does, Caterpillar engineers are constantly looking for ways to improve it. And, the new model is *not* made available until it has been thoroughly job tested. That's the story behind the new DW15 (Series E)-No. 428 LOWBOWL Scraper. It's ready. The DW15's engine delivers 200 HP (maximum output capacity). With speeds up to 37.2 MPH, plus the extra sure-footedness of four wheels, the DW15 gives you faster hauls and cycle times with greater safety. The No. 428 Scraper has a capacity of 13 cu. yd. struck—18 cu. yd. heaped—and it loads quicker and more easily because of LOWBOWL design.

Your Caterpillar Dealer will gladly demonstrate the new DW15 and show you how it can pay off for you!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

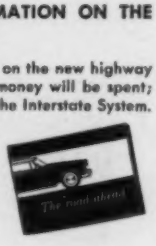
CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

THE LATEST, MOST COMPLETE INFORMATION ON THE NEW HIGHWAY PROGRAM — FREE

Here in one booklet is *all* the latest information on the new highway program. Find out how, where and when the money will be spent; standards for the new freeways; final routes of the Interstate System. Everything you need to know to share in the greatest construction job in history.



Dept. EE-9, Caterpillar Tractor Co.
Peoria, Ill.

Please send me immediately ..... copies of "The Road Ahead."

Name.....

Company.....

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TODAY'S BUCKET IS THE KIESLER!

IT DIGS
DEEPER
IT DUMPS
FASTER

LEVERAGE . . .
WHERE IT REALLY COUNTS!

Years ago there was only one way to move freight cars — by brute force. Today there are power winches that do the job faster and easier. So it is with clam shell buckets: today your excavating or rehandling jobs can be done faster and with less effort . . . with a KIESLER bucket!

THAT THE KIESLER BUCKET DOES DIG DEEPER AND DUMP FASTER THAN ANY OTHER BUCKET IS NO IDLE CLAIM! Here are the facts: It digs deeper because the powerful leverage is applied through TWO lever arms with EQUAL force to BOTH shells. This digging force, unequalled by any other bucket, is achieved without unnecessary parts to the line, with less cable, and without extra dead weight.

The KIESLER bucket dumps faster because of the exclusive shell design which gives a more positive dumping angle the instant that the jaws start to open (not only when the jaws are wide open). Thus, the operator can eliminate spillage by spot dumping. This results in minimum handling costs and affords more time for additional work.

The KIESLER bucket with its rugged construction and powerful design has what it takes to produce the greatest yardage with less effort, and with a minimum in maintenance. Phone or write to learn first-hand how KIESLER can save you time, money and manpower on your excavating or rehandling jobs.

GUARANTEE
Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.
Since 1892

944 W. HURON ST. • CHICAGO 22, ILL. • MOnroe 6-7144

News . . .

Continued from page 38

1950 was the Northern Illinois Coal Corp., with strip pits in Illinois and Indiana producing 4 million tons a year at that time.

At the time of its merger with Peabody in 1955, Sinclair was the nation's third largest producer and Peabody was eighth. Their combined sales in the previous year had been more than $72½ million.

Mr. Kelce's business interests branched out beyond coal. From ownership of two small mine railroads, he and his associates reached out to become stockholders in the Kansas City Southern Railway in 1944, and the Chicago Great Western three years later. From his offices in Kansas City, Mr. Kelce at various times also kept tabs on oil and gas properties, a stove company and a coal shiploading firm in Chicago.

As head of the land use committee of the National Coal Assn., Mr. Kelce led the way in reclamation of ugly strip mine waste land. Methods were worked out to reseed the scarred hills for pasture, sometimes by dropping the seed from helicopters. The coal company's Sinclair Farms affiliate, utilizing such land, showed a profit.

Gov. Phil M. Donnelly appointed him to the Missouri resources and development commission in November 1955.

Mr. Kelce was a member of the Country Club Methodist church, the Bohemian club, River club and the Mission Hills country club.

Surviving him are his wife, Gladys; a son, Robert D., Belleville, Ill.; his parents, Mr. and Mrs. David Kelce, and a sister, Mrs. Marie Hartman, Pittsburg; two brothers, Merl C. Kelce, St. Louis, Mo., president of Peabody Coal Co., and T. L. Kelce, Chicago, Ill., senior executive vice president of Peabody Coal Co., and president of Peabody-Southern Coal Co.; and three grandchildren.

Rumaggi Takes CE Post

Brig. Gen. Louis J. Rumaggi has taken over the duties of division engineer, U. S. Army Engineer Div., North Central Corps of Engineers, Chicago, Ill. He succeeds Brig. Gen. P. D. Berrigan, division engineer since June 1955, who has retired from active military duty.

As division engineer, Gen. Rumaggi has jurisdiction over district offices at St. Paul, Minn., Chicago and Rock Is-

Continued on page 42

How tractor work-and-run mobility

puts dollars in your pocket

17 mph LeTourneau-Westinghouse Tournatractor®, rolling on big, 2' wide, low-pressure tires, is never more than a few minutes away from its next assignment anywhere in your work area. There's no delay . . . no waiting for truck and trailer . . . no loading or unloading . . . no extra equipment or manpower expense. Operator just hops on, shifts into high, and he's on his way!

Takes shortest route to any job

Tournatractor always takes the shortest route — via road or cross-country. It travels over blacktop, city streets, sidewalks, curbs or RR tracks . . . without planking. Big (5'11" high), low-pressure tires spread to distribute the load . . . flex, and roll easily over obstacles.

Puts "wait-time" to work

When your Tournatractor gets caught up with its present assignment, there's no need to let it sit idle. Let its high-speed mobility pay off for you. Send this rubber-tired tractor to handle scattered odd jobs anywhere in the area. Use it for fast push-loading or towing . . . for heavy dozing to improve haul-roads, detours, or drainage. In addition, unit's rubber-tired mobility lets you move freely from wet to drier work areas . . . to fill in with profitable small jobs between big-job assignments. You'll find there's nothing like Tournatractor for handling more work over a wider area — without excessive tractor moving expense.

Provides quick emergency service

In only 10 minutes, mobile Tournatractor can be handling a critical dirtmoving task 2 miles away. With mobility like this, you can always be sure of prompt help . . . when and where you need it. This quick emergency service — plus Tournatractor's flexibility of application for helping out and speeding up any behind-schedule operation — can save you thousands of dollars on a single contract. Also, machine gives greater efficiency on over-all operation, and can cut valuable days from your completion dates.

Meets all 4 dimensions

Besides mobility, Tournatractor has ample ability to meet the other 3 essential dimensions of today's earth-moving . . . power, traction, and speed. Write for free 32-page illustrated bulletin, "All 4 dimensions".

CT-1463-DC-1

Optional attachments increase Tournatractor's range of application

ANGLEDOZER® — four-way adjustment permits angled blade to be tilted up and down on either corner — forward or back on either side. Excellent for side-hill work.

SHEEP'S FOOT ROLLERS — L-W tractor easily tows two or four-drum roller units. Tournatractor's big tires help complete specified compaction in fewer passes.

POWER-CONTROL-UNIT — rear-mounted doubled-drum PCU enables Tournatractor to operate any cable-operated scraper. Also powers other cable-type equipment.

BUMPER AND PUSH-PLATE — for pusher duty. Heavy, all-steel welded push-plate is 4'5" wide and 3'4" high. Full width bumper is 3" thick, 16" high, curved at ends.

NOTE: Snow plow and wing, root rake, heavy-duty winch, tree stinger, down-pressure attachment, cab, lights, 18-yd. electric-control scraper, also available.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

News . . .

Continued from page 40

land, Ill.; Detroit, Mich.; and Buffalo, N. Y. He is responsible for military construction and military real estate activities in the states of Minnesota, Wisconsin, Michigan, Illinois and Indiana, as well as a civil works program which reaches into 12 states from northwestern North Dakota and northern New York south to Saverton, Mo., on the Mississippi River.

Gen. Rumaggi served as district engineer, Detroit, from December 1948 to May 1950. His last post was as chief of staff, Sixth Army, San Francisco, Calif.

Publicize Anthracite Industry

To mark the sweeping revitalization of the hard coal industry in the northeastern United States, the seven days from September 16-22 have been designated as Anthracite Week.

The purpose of the campaign, according to the Anthracite Information Bureau, 342 Madison Ave., New York 17, N. Y., is to increase public awareness of the latest developments in automatic anthracite burning equipment and demonstrate the economy of this type of fuel.

Traditionally a major factor in the economy of the northeastern states, the anthracite industry today employs over 100,000 people and pays over $155 million a year in wages. Its retail sales exceed half a billion dollars annually.

Official slogan of the week is "Anthracite—Fuel of the Future."

"Daddy, is that the fathead you said you'd like to ram a stick of dynamite—ulp!"

Tunnel Job Started

Work has begun in England on a 4,700-ft. long tunnel under the Thames River between Dartford and Purfleet on the Kent and Essex sides of the river. The tunnel will help provide a direct link between Kent and Essex, 14 miles east of London.

A £.6 million contract for driving and lining the main tunnel and for constructing its immediate approaches was awarded to Messrs. Edmund Nuttal, Sons & Co. (London) Ltd. by the Ministry of Transport and Civil Aviation, as agents of the Tunnel Joint Committee.

The program was begun in March when in an iron-lined chamber 80 feet below the Kent bank, Harold Watkinson, Minister of Transport and Civil Aviation, tightened the last nut securing the first ring of the main tunnel lining. It was the first of more than 2,500 cast iron rings which will be erected as the tunnel is driven.

The existing shield chambers, placed at the bottom of 80-ft. shafts on each side of the river, now are sealed at their working faces by reinforced concrete bulkheads six feet thick. Because water seeps through the crevices of the chalk, an awkward substance in which to work below water level, the chambers must be pressurized before the concrete seals are removed and excavation can begin.

Miners will use pneumatic spades to attack the face from the 16 open cells formed by the cross members of each of the shields. After disposing of an initial stratum of gravel, they will cut into the chalk, throwing the debris on to conveyors which will take it to the back of each of the shields. Here it will be pulverized and mixed with water. The resulting slurry will be pumped through

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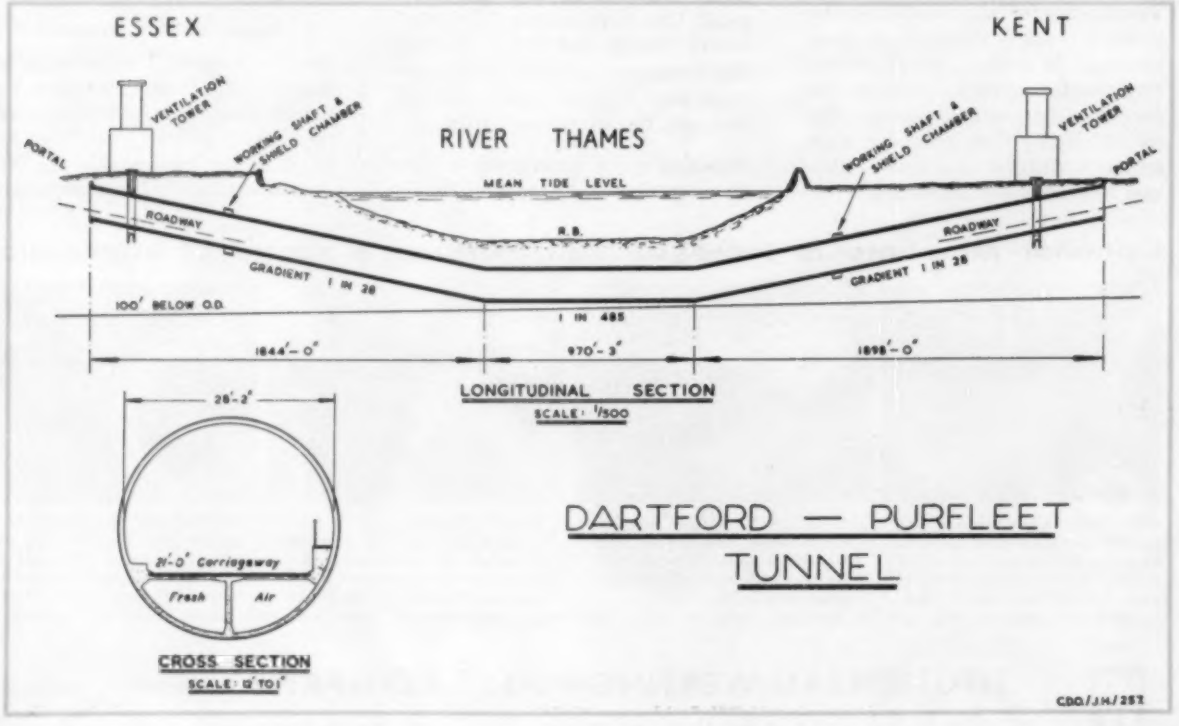
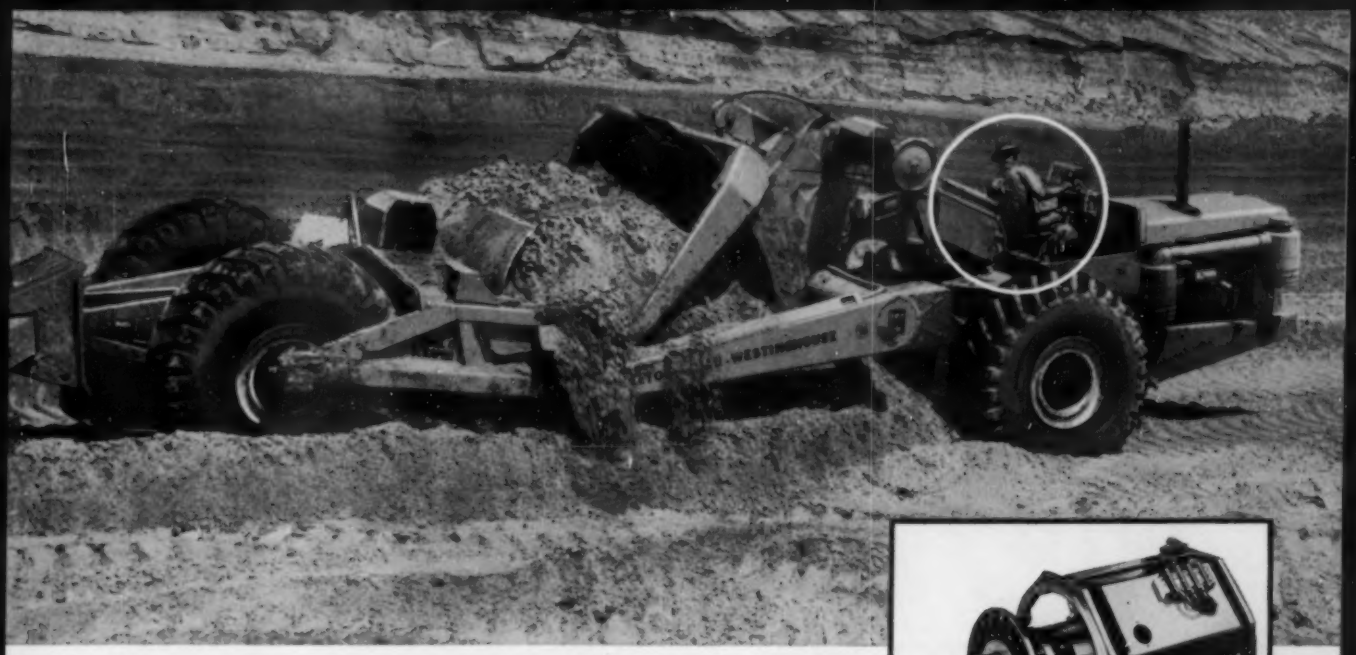




Fast, accurate work . . . at lower cost with *electric control* Tournapulls

One reason modern LeTourneau-Westinghouse Tournapulls are so fast-working is because they are controlled with the smooth, clean, *instant* power of electricity. With fast, dependable electric controls, your operator does *more* work . . . *higher quality* work . . . and maintenance costs are lower. Here's why:

Exclusive fingertip controls on dash

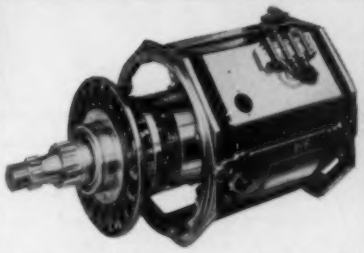
On all L-W Tournapulls, operator steers . . . operates scraper bowl, apron, and tailgate . . . just by moving small electric control switches on dash. When switch is pressed, point-of-action motor is immediately activated. Action stops the moment switch is released . . . or stops *automatically* when pre-set limit of travel is reached. Because control is so easy, operator works faster . . . more accurately . . . with less fatigue.

Simple, trouble-free electrical system

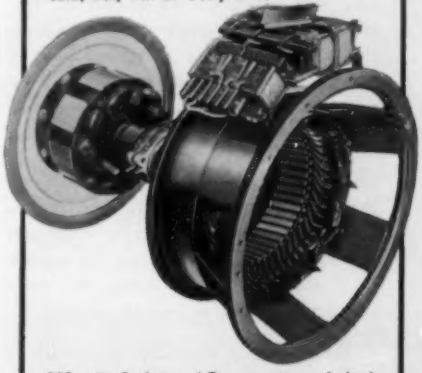
A heavy-duty AC generator — mounted in line with unit's diesel engine — supplies power for steering and control motors. Pressing dash-control switch sends current *through flexible insulated wires* to weatherproof, high-torque, point-of-action motors. Spring-loaded brakes are released, and motor turns at top speed — within ¼ second. Electric power is converted, through gears and short cable, to desired action at the apron, tailgate, or bowl hoist . . . and through gears to kingpin steering control. Operating electricity is generated only when point-of-action motors are in use. There's no continuous drag on the engine, to rob horsepower and add to fuel costs.

Low maintenance costs

More than 19 years of experience building more than 13,000 self-propelled scrapers — in service all over the world — proves the merits of this exclusive L-W electric-control system. Eliminated are troublesome repairs and adjustments common to hydraulic or mechanical systems. With Tournapulls, you convert time saved on downtime and maintenance to production time. Also, Tournapull® scrapers normally use only about half the lubrication of competitive self-propelled scrapers . . . further reducing operating costs.



Weatherproof motors are "squirrel-cage" type, operating on AC current. Simple, compact — motors consist of only two foolproof parts; rotor and stator. They always give same, swift action — no matter how cold, hot, wet or dusty it is.



300-volt, 3-phase, AC generator — bolted to prime-mover's engine flywheel — supplies power for steering and control motors. Transmission of power through electric cables eliminates problems of lubrication, breakage, leakage, high-pressures, and clogging of hydraulic and mechanical control systems. Generator may also be used as an emergency source of electric power.

Ask for complete information

Write today for details on Tournapull's many *profit-making* features. 3 scraper sizes: 9, 18, 27 yards. Same electrical system powers interchangeable haul units . . . rear-dump, crane, and self-loading flat-bed.

P-1466-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Used highway trailers get a new lease on life as portable offices for the contracting firm of MacDonald, Young & Nelson.

News . . .

Continued from page 42

pipes up to the surface, where it will be deposited to form the earthworks that will serve to hold back river flood water from the cuttings.

Each time excavation has been completed over the whole face to a distance varying between 18 inches and three feet, the shield will be thrust forward and, with its great ring-shaped steel knife, it will trim the inner surface of the tunnel as it is formed. A new lining ring will be completed behind it. The rams will then be made ready to bear on the new lining ring and the laborious process repeated. Cement grout will be pumped between the iron lining and the chalk face to complete the structure.

An estimated 3 million cubic feet of chalk and gravel will be removed. Tunnelling landwards from the shaft bottoms towards the projected approach cuttings probably will not be started until the main tunnel under the river is driven.

Novel Idea for Construction 'Shacks'

Contractors whose work is primarily on major projects have long faced a recurring problem—the need for portable office and storage space at job sites.

One California firm, MacDonald, Young and Nelson, San Francisco, has found an interesting solution to this problem. They use the "boxes" from second-hand highway trailers.

The firm formerly built its own portable offices and tool sheds at a cost of some $500 to $800 each, but experience demonstrated these structures, though well built by standards of wood construction, would not hold up beyond three or four jobs. The stresses of being jacked up and moved from job to job soon loosened joints to the extent that the portable buildings became useless.

MacDonald, Young and Nelson now has 15 converted trailer boxes which are used on jobs in California and Nevada. They figure the cost of these units at under $500 each and find them practically indestructible.

Frank Stearns, construction foreman of the firm, suggests other users thinking about trying trailer boxes for offices should specify equipment that was refrigerated when used as a highway hauler. "These old refrigerated trailers," says Stearns, "are well insulated and minimize air conditioning problems in both summer and winter. We purchased ours from the used trailer sales branch of Fruehauf Trailer Co. in Oakland, and have been very satisfied with them. Painted with company colors, they are attractive, and have good advertising value, too."

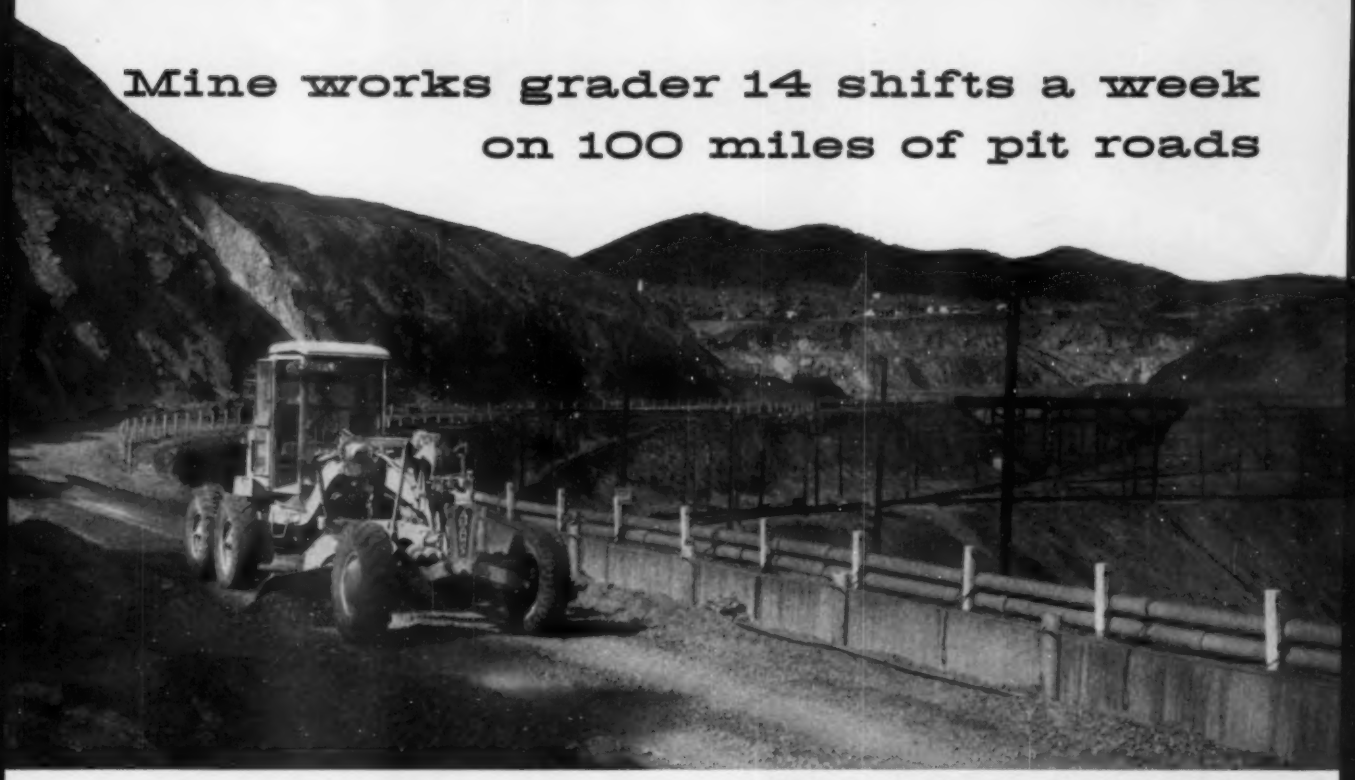
For movement to job site, the boxes are lifted to the deck of a flatbed trailer, either by fork lifts or hydraulic jacks. If the construction job is to be a long-term project, the trailers are then placed on the ground at the site for semi-permanent installation; should the job be a short-term project, the trailer boxes are left on the flatbed.

Conversion of the trailer boxes to portable offices is simply a matter of installing windows, flooring and wiring. Use as tool sheds requires little or no conversion.

"Before we got the trailer boxes," Stearns said, "we used to build from 10 to 15 portable offices or storage houses each year—moneywise, somewhere in the neighborhood of $4,000 each year. Our trailer boxes will save us that $4,000 next year and each year thereafter."

Windows and light fixtures have been added to this converted trailer box. Contractor recommends use of former refrigerator trailers to simplify air conditioning.

Mine works grader 14 shifts a week on 100 miles of pit roads



Fast-moving Adams 550 grader does lion's share of maintaining more than 100 miles of bench roads at big copper mine. This 123 hp unit grades, ditches, backslopes, does scattered clean-up work.

Two shifts a day, 7 days a week is the rugged schedule of work for a 550 Adams* motor grader at a big southwestern copper mine. 4 to 6 operators take turns manning this heavy-duty unit as it hustles about . . . maintaining more than 100 miles of steep, winding mine roads.

Adams handles many jobs

Roads at the mine coil around the huge open pit, along wide benches 15′ to 20′ high. Surfaced with crushed stone, roads vary in width from one to six lanes. Usually working in 2nd gear, the Adams 550 grades fast and accurately. It ditches, backslopes, does all-around work — such as filling ruts, leveling ridges, and cleaning up debris fallen from banks or spilled from haul units.

Tough assignments, long hours, are right down Adams' alley. Built to withstand severe stress and strain, these graders can take it!

Structurally, the "550" has a big, all-steel box frame for lasting strength and rigidity. It is continuous-welded to take stresses as a unit — from bolster plate to boxed-in rear end. Streamlined, front to rear, this Adams frame has no sharp bends, no cross-section welds, no bolted or riveted joints to break. Front axle is made of welded heavy bar and plate . . . with yokes, kingpins, and spindles of forged, heat-treated steel. This rugged frame foundation, outstanding in the industry, is a basic factor in Adams' accuracy of control, low power loss, and speed as well as its dependability and economy of performance.

Power-wise, the two engines from which you can choose have been job-proven in more heavy-duty construction and road maintenance use around the world, than any other engines available anywhere. Mechanically, all gears and shafts run on anti-friction bearings, and all clutches slide on ball bearings. The 8-speed transmission is the finest ever built for use in a motor grader.

Adams lasts longer, works harder

Net result is a motor grader that lasts longer, works harder . . . with less upkeep. From the utility 220 model, with 60 hp . . . through 80, 115, 123, and 150 hp sizes . . . to the big torque-converter POWER-*Flow* 660, with 190 hp . . . Adams gives you more grader for your money.

Look into the Adams line of heavy-duty motor graders. Your LeTourneau-Westinghouse Distributor has all the facts and will be pleased to arrange a working demonstration of the model that fits your needs best.

Twisting uphill grading is done faster with Adams 550, because it offers *several* full-power speeds for each kind of work. With 15-speed transmission available, operator can always select gear that will get the most work done at the lowest cost. *Trademark G-1485-M-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Equipment You Ought to Know About

30-Yd. Trailer Dump

Manufacturer: Galion Allsteel Body Co., Galion, Ohio.

Claims: A new Galion 30-cu. yd. tandem-axle trailer dump is designed for economical bulk materials hauling in areas where highway weight limit laws set a medium gross weight limit and allow credit for only one set of tandem axles.

Known as the model STMF Transporter, the trailer dump is intended for use with single rear axle tractors. It is fitted with a front-mounted Uni-scopic single cylinder telescopic hoist which shifts hoist weight forward onto the tractor-axles. This permits additional loading of the trailer axles and increases payloads, the manufacturer states. Matched design of Uni-scopic hoist, chassis and body is said to afford unexcelled stability, both on the highway and when dumping. The STMF can be used for direct dumping into road surfacing machines.

The chassis, of fabricated steel construction, is supplied with tandem Stabl-ride or center pivot bridge-type suspension. A full selection of axle capacities, brake types, tires and optional equipment is offered. Understructure consists of closely spaced 4-in. channel cross-members gusseted and welded to 6-in. I-beam longitudinals. The compact hoist well, fully welded and reinforced to distribute hoist lifting forces uniformly, is fitted with a removable access cover for

hoist cylinder inspection. Ten-gauge high resistant steel is used throughout the body.

Offered in body lengths from 19 to 26 feet, the STMF Transporters have payload capacities of 10 to 40 cubic yards. Three optional Uni-scopic hoists, with lifting capacities up to 30 tons, are available.

Dolly for Tournapull

Manufacturer: Reisser Corp., P. O. Box 362, Blair, Nebr.

Claims: A new accessory for use with LeTourneau-Westinghouse Model C Tournapulls is a convertible-wheeled dolly which quickly attaches under the nose of the prime mover to bring the unit within legal axle limits for highway travel.

An unusual feature of the unit is the convertibility which makes it a dual-purpose tool.

On arrival at the job, the dolly is easily transformed into a two-ton mobile utility crane. Hitched behind a panel or pickup truck, it can handle any of

a wide variety of hoist and carry assignments.

According to Reisser, the dolly-crane can be used to road any electric line C Tournapull.

The dolly features a simple three-point hook up. All connections to the prime mover are made without the need for special tools, crane or jacks.

With the dolly positioned on the ground in front of the Tournapull, the operator lowers the scraper bowl of the machine to just above ground level and noses over the dolly frame. When the bumper plate on the front of the Tournapull butts against the vertical channels of the dolly frame, positioning is complete. By raising the scraper bowl to maximum height, the nose of the machine is forced down against the dolly. This downward pressure automatically lifts the rear of the dolly frame up against the belly-pan of the Tournapull. This done, all that is necessary is to fasten four bolts.

A "yoke" bolt is slipped over the pull hook on each side of the Tournapull frame and bolted to the dolly frame. Then, a heavy-duty bolt on each side of the radiator screws down against the nose section of the main case of the Tournapull to hold the dolly tight against the belly-pan.

The amount of weight transferred from the drive wheels of the Tournapull to the dolly wheels is easily adjustable to meet variations in legal requirements. Inserting shims behind the big compression springs on the dolly increases the amount of weight carried on the dolly wheels.

The dual wheel assemblies of the dolly are mounted on large, tapered roller bearings which permit them to caster freely.

When roading is completed, conversion of the dolly to its role as mobile "stiff leg" crane is quick and easy. After its removal from the Tournapull, two bolts are inserted in each of the dolly casters, locking them to hold the wheels in parallel tracking position. Then vertical support, boom and jib assemblies are bolted to the dolly frame, and the conversion is complete.

Nine-Wheel Pneumatic Compactor

Manufacturer: Chester Products Co., N. 5th St. and Ford Blvd., Hamilton, Ohio.

Claims: A power-drive multi-wheel pneumatic compactor designed for base, subbase, bituminous paving and soil-cement compaction is available from Chester. The unit is the model 9W P. D.

Nine rolling wheels with 7:50 x 15 smooth tires are pair-mounted for maximum oscillation in a "cover-all" pattern, with four wheels in front and the rear

Continued on page 48

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At a pit in Germany...

2 Rear-Dumps move 180 tons every hour over 1150 ft. of rough pit floor

At an important German quarry, south of the Ruhr, two Model C Tournapull® Rear-Dumps haul out about 180 tons of blasted limestone rock each working hour.

The German firm, Rheinisch-Westfallische Kalkwerke-Aktiengesellschaft, Dornap, is using these heavy-duty haulers in removing the top layer of a limestone hill at the company's Honnetal quarry. This quarry supplies lime to the chemical and construction industries, and to the steel mills of the Dortmund-Hagen area. Lime dust from this plant is also used in mines to control fires and explosions.

Body design withstands shock loads

A shovel loads the two Tournapulls (one with an earlier 18-ton capacity, the other a current 22-ton model) with large chunks of limestone. The Rear-Dumps' egg-shaped bowl design tends to safely deflect shocks of loading. According to extensive tests in this quarry, trucks with a box-shaped body could be loaded to only 70% of capacity, while Tournapulls were consistently loaded to 85% and 90% of capacity.

During typical operation, Rear-Dumps haul rock about 1150 feet over the rough pit floor. Each unit delivers about 90 tons hourly to a crushing plant, says Graduate Engineer Hettwer, Technical Manager of the quarry.

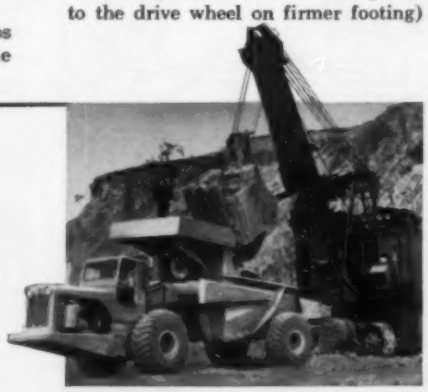
Tournapulls also haul out waste loam and clay from fissures in the rock. On the waste dump, Tournapulls' big, low-pressure tires and power-transfer differential (which channels more power to the drive wheel on firmer footing) provide ample flotation and traction for hauling across loose fill.

Maneuverability saves time

At times, other types of haul units have been used for transporting rock here. However, they were unable to turn within the narrow space between the pit wall and the shovel's power cable in order to position for loading. Consequently, a bridge had to be laid over the cable for them to drive across. In contrast, Tournapull Rear-Dumps, with their 90° kingpin power-steer, can turn easily in the cable-to-wall space, eliminating the time-robbing practice of having to lay, move, and maintain a plank crossing over the cable.

When you have heavy material to move, or when you must work in a confined space, you will want to know more about Tournapull Rear-Dumps: 11, 22, and 35-ton sizes. Write us for full information on LeTourneau-Westinghouse equipment.

CR-1386-Q-1



Despite the constant shocks of loading this heavy limestone rock, and of hauling over a rough, rocky surface for 16 hours daily, Tournapull Rear-Dumps have needed little repairs. One Tournapull has worked for more than 2¾ years; a second machine for longer than two years. Most months, Rear-Dumps' operating efficiency is over 90%.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

New Equipment . . .

Continued from page 46

wheels extending beyond the body to allow operation close to obstacles.

Maximum compactive effort is 2,000 pounds per wheel with water ballast and optional six-ply 7:50 x 15 tires inflated to 34 pounds. The body is constructed with a drop-center design to maintain a low center of gravity. It has an 85-cu. ft. ballast capacity. Rolling width is 66 inches, ground clearance is 15 inches and body height is 52 inches. Construction of the fifth wheel permits short radius turns.

Features of the 9W P.D. are power steering, double-disc brakes, an elevated operator's seat and a gasoline engine rated at 38 bhp at 2,000 rpm. The transmission provides six forward and two reverse speeds.

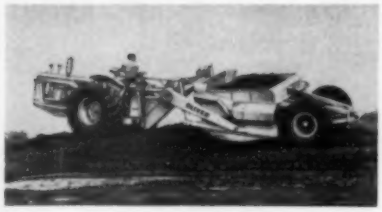
Optional equipment available includes diesel engine, torque converter with automatic reversing transmission, additional water ballast tanks, front and rear wheel mats, front and rear sealed-beam lights and pump tanks, and spray system for soil cement.

6.7-yd. Oliver Scraper

Manufacturer: Oliver Corp., Industrial Div., 400 W. Madison St., Chicago 6, Ill.

Claims: A new low-cost 6.7-yd. capacity scraper combining speed, maneuverability and small size, has been put into production by Oliver.

The new Model 990 scraper is powered by a 3-cylinder GM diesel of 77.4



drawbar hp with 6-speed transmission. Torque converter is also available as optional equipment. The power unit was selected to give the machine maximum working ability with low operating costs. Its compact size (8½-ft. width) with ample road speeds makes driving from job to job fast and easy.

The machine has all-hydraulic design which gives smooth, responsive, positive steering and scraper operation, even in loose or sloping ground. Offset cutting with curved bowl arrangement results in rapid loading and hydraulic pressure ejection in a fast unloading cycle. Sharp turns and close-quarter working can be handled easily because of the machine's steering maneuverability.

Sprinkler Tank

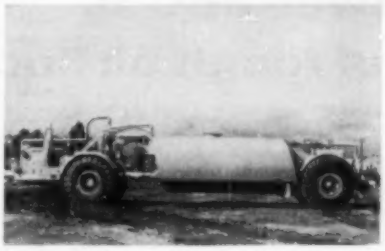
Manufacturer: Southwest Welding & Mfg. Co., 3201 W. Mission Rd. Alhambra, Calif.

Claims: A 6,000-gallon capacity semi-trailer sprinkler tank has been developed by Southwest. The all-steel trailer is designed for use with the single-axle Caterpillar DW 21 tractor.

The tractor-tanker combination operates on all types of terrain from soft fills to hard haul roads. Large 29.5 x 29 tires afford adequate flotation on the softest materials.

Designated the STT-60, the trailer is 10 feet wide and 11 feet 10 inches high. The tank section is 18 feet long, 76 inches deep and 108 inches wide. Wheel base of the trailer is 27 feet 3 inches and length of both units is 45 feet.

Front and rear spray bars are equipped with adjustable nozzles with a spray



swath up to 55 feet. The 1,500-gpm spraying pump is a 6-in. self-priming, centrifugal type powered by a six-cylinder gasoline engine. Simple, fingertip, air-actuated in-the-seat controls are regulated by the tractor operator. A gravity type bar is included as standard equipment.

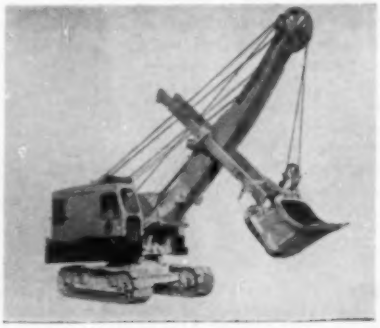
2-Yd. Excavator

Manufacturer: Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.

Claims: A new crawler-mounted unit, designated the model 805, has been added to the Koehring line of excavators. Capacities of the new model are 2 to 3 cubic yards as a dragline; up to 3½ yards as a clamshell; or 2 yards as a shovel.

Equipped with friction-type steering brakes that are spring-set and air-power released, the 805 can turn within its own length when one crawler is completely locked. Main clutches have a mechanical power booster, cam action and automatic adjustment for heat expansion.

The dipper on the 805 shovel is crowded into a cut by a heavy roller chain. A high A-frame, power raised or



"No, I didn't get caught in a cave-in. I'm just a mole coming up for air!"

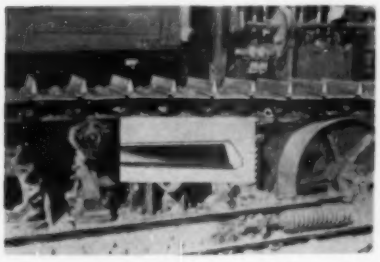
lowered, is standard equipment on all cranes using 75-ft. booms or longer.

Six turntable and six hook rollers assure operating stability and evenly distribute the 805's weight under digging or lifting strains. Anti-friction bearings are used on the countershaft, horizontal swing and traction shaft, main drum shaft, vertical swing and traction spur bevel gear shaft, revolving fairlead yoke and retract clutch drum. They are also used on all other shafts where speed is sufficiently high to justify anti-friction bearings or where significant amounts of power can be saved from friction loss.

Tractor Grouser Retreads

Manufacturer: Allied Steel & Tractor Products, Inc., 7835 Broadway, Cleveland 5, Ohio.

Claims: A new line of tractor grouser retreads for rebuilding the grouser shoes of track-laying or crawler-type equipment has been announced by Allied Steel & Tractor Products. Use of the Bulldog tractor grip-lugs permits equipment to



be re-lugged without dismantling—saving hours of down-time and labor.

According to the manufacturer, Bulldog Grip-Lugs have a specially-designed shape, with an engineered groove and bevel that permits welding application much faster and cheaper than using original parts. Inexpensive American Welding Society E-6016 or E-7016 low-hydrogen electrodes can be used.

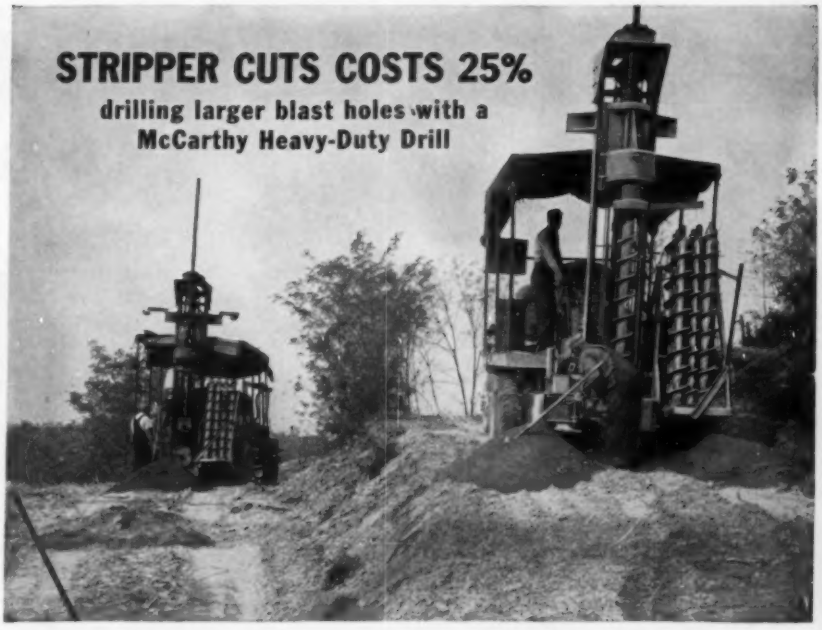
Shapes and sizes are available to fit any track-laying or crawler-type equipment. Supplied in 10-ft. lengths, Grip-Lugs are also available cut-to-length, ready to weld, at extra cutting charge.

Telescopic Hoists

Manufacturer: Gar Wood Industries, Inc., Wayne, Mich.

Claims: A new line of Gar Wood-St. Paul front-mounted telescopic hoists is designed to permit greater payloads under current axle weight-limit laws. The new hoists feature an exclusive ball and socket mounting at the base and top of

Continued on page 52

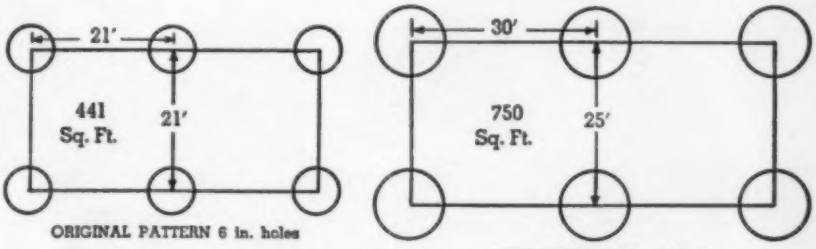


This strip mine operator cut drilling and blasting costs 25% by using this 25' x 30' pattern of 8 in. blast holes—drilled by two McCarthy Heavy-Duty Vertical Auger Drills.

A Southern Ohio strip mine operator cut his drilling and blasting costs by 25% when he widened the blast hole pattern and switched from 6 in. diam. to 8 in. diam. holes. He used McCarthy Heavy-Duty Vertical Auger Drills and a new type of explosive to remove the sandstone overburden.

A cost study made by the operator shows that the McCarthy drill bored the 8 in. holes at less cost than the 6 in. holes. Four 6 in. diam. holes covered 441 sq. ft. Four 8 in. holes covered 750 sq. ft. Since fewer 8 in. holes were required to drill the same area, over-all drilling time was cut in half. In each pattern, the amount of hard rock drilling was the same. The study included five work shifts of two McCarthy Model 106-24 Auger Drills, one using 6 in. and the other using 8 in. flights. The stripper figured all drilling and blasting costs, including fuel, labor, bits, explosives, etc. Over-all cost saving was 25%.

McCarthy Heavy-Duty Vertical Auger Drills drill up to 24 in. diam. holes faster than any other auger drill. Start cutting your costs now by phoning the nearest Salem Tool representative. Or write for Bulletin M-100.



ORIGINAL PATTERN 6 in. holes

NEW PATTERN 8 in. holes

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In the Low-Cost Production Race
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The economical operation, big production and year-after-year dependability of Bucyrus-Erie walking draglines make them pace setters wherever big volumes of material must be moved at lowest possible cost. You'll find them in mines and quarries from Missouri to Sweden . . . from Pennsylvania to British Guiana.

Each member of this famous line, from 4 to 36 cubic yards, brings you the same low cost and dependable performance that have been associated with Bucyrus-Erie walking draglines for years. Heavy-duty construction from base to boom point cuts maintenance costs, adds years to machine life. Each machine has *proved* Bucyrus-Erie design superiority — a front end that's very strong yet light in weight — exclusive walking action with simplicity that reduces maintenance, gives you cushion-smooth moveups — Ward Leonard variable-voltage swing motors on both Diesel-powered and all-electric-powered machines speed cycles, boost output. These and many other features combine to give you a high-volume, low-cost-yardage excavator that sets the pace wherever it works.

129L57C

BUCYRUS ERIE

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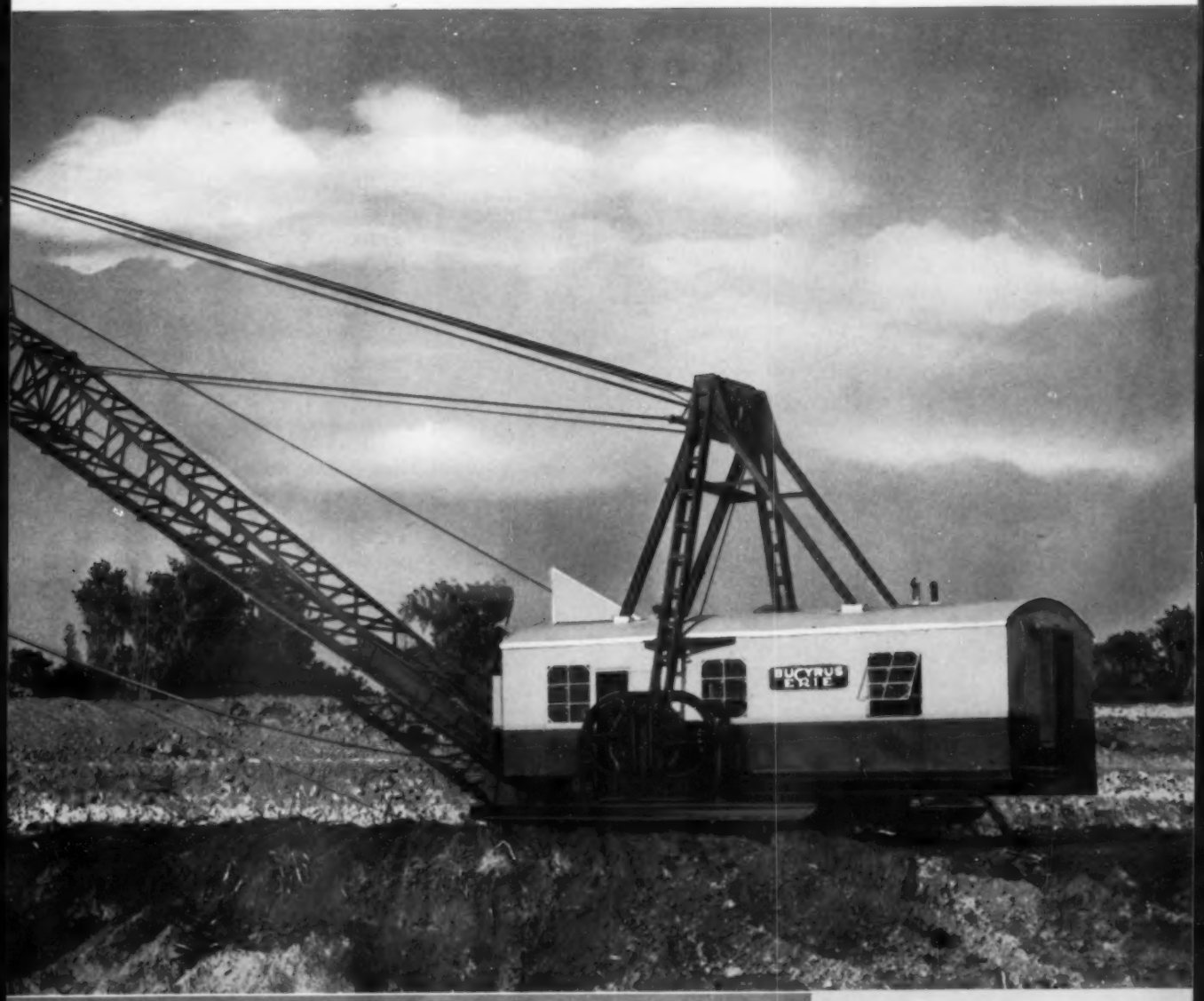
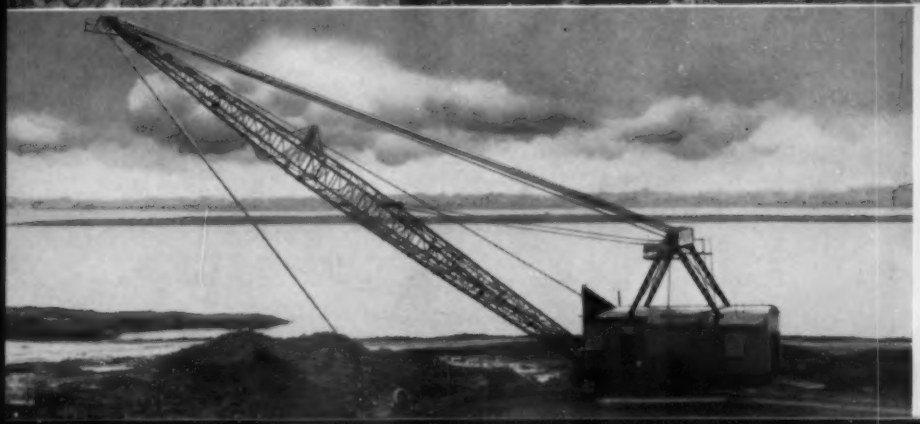
BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WIS.

7-W *strips overburden in a Georgia clay mine with 6-cu. yd. bucket on a 160-ft. boom.*

-Erie *Walkers* Set the Pace





180•W *swings 6-cu. yd. bucket on 120-ft. boom to build an earth dam for settling area in owner's phosphate mine in Florida.*

200•W *with a 6-cu. yd. bucket on a 110-ft. boom keeps haul units busy on a section of the St. Lawrence Seaway.*

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New Equipment . . .

Continued from page 49

the cylinder to eliminate side load stresses. In addition, special "X-type" bracing gives the sub-frame unusual strength and rigidity.

Wide brass bearings inside the cylinder provide a large bearing surface to protect the cylinder walls. Cylinder sleeves, made of special seamless alloy steel, are bored and honed to a highly-polished finish to reduce binding. Heavy

brass packing nuts at top and base of each cylinder make proper adjustment of packing easy.

An automatic safety relief valve eliminates extreme high pressure at the end of the cylinder stroke, reducing overheating, wear and leakage. A safety control valve stops further movement of the hoist at the end of the stroke to prevent overtravel damage.

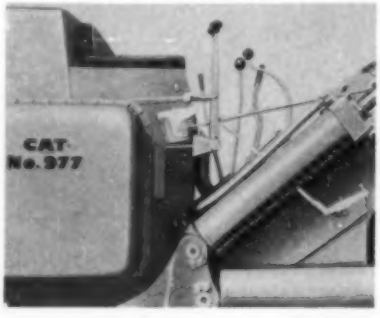
Gar Wood has also announced a new line of bodies, especially designed for the new front-mounted telscopic hoists.

Automatic Bucket Positioner, Other Cat Products

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Caterpillar has announced automatic bucket positioners for the No. 955 and No. 933 Traxcavators. Already a standard feature on the Cat No. 977 Traxcavator, the bucket positioner automatically moves the bucket tilt control lever from tilt-back position to the hold position when the bucket reaches a preset digging angle.

The adjustable linkage provided with the bucket positioner allows the bucket



to be positioned at any point between an approximate 5° digging angle and a 3° tilt-back angle.

Field change-over kits are available for No. 955 and No. 933 Traxcavators already in operation.

A normalizing kit is now available for the Cat D8 tractor. The kit, which consists of a turbocharger and all manifolds and adapters needed to mount it on the tractor engine, overcomes the cause of high-altitude power loss—insufficient oxygen to permit complete combustion of fuel.

The turbocharger permits complete fuel combustion and restores "sea level" horsepower up to an altitude of 10,000 feet. The kit does not increase the sea level horsepower, but serves only to provide the needed oxygen to burn the same amount of fuel at high altitudes as at sea level.

Cat has announced three new portable diesel electric sets—the D311, D315 (Series G) and D318 (Series G), each equipped with the new compact Caterpillar generator.

The D311 develops 30 KW of 60-cycle, 3-phase current. The D315 (Series G) is rated at 40 KW and the D318 (Series G) at 60 KW.

These units are available either skid-mounted or with running gear. The output of their self-regulated, constant-voltage generators furnishes a choice of 120, 240, 120/208 or 480-volt current at 1,800 rpm. Standard equipment on the sets includes 24-volt, 18-ampere charging generators and 24-volt, 170 ampere-hour battery sets. The power units also come equipped with 24-volt direct electric starting, wrap-around bases, control panels and water temperature-oil pressure safety shut-offs. The two smaller sets have 50-gallon fuel tanks. The D318 (Series G) has a 57-gallon fuel tank.

Automatic start-stop systems are available as attachments for four more Cat diesel engines—the D326 (Series F), D337 (Series F), D375 (Series D) and D397 (Series D).

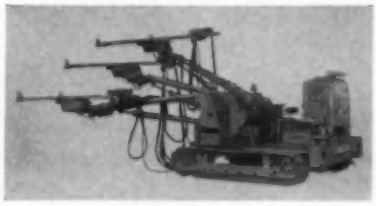
Finding principal application on electric set installations, the systems instantaneously crank the diesel engine when utility power fails. When the generator comes up to 90% of rated voltage, an automatic transfer switch changes the load from utility source to the electric set. The transfer switch reverses the load to the utility line and shuts down the electric set when utility power is restored.

Gardner-Denver Jumbo

Manufacturer: Gardner-Denver Co., Quincy, Ill.

Claims: Gardner-Denver's new JMT MOBILJUMBO is a self-propelled, crawler-mounted jumbo unit which puts rock drills under finger-tip control at the operator's position.

The MOBILJUMBO is available with crawlers powered by either diesel hydraulic drive or by five-cylinder radial air motors. The MOBILJUMBO is furnished with two or three creep-free hy-



draulic booms. Rock drills and feeds may be selected to suit the ground being worked.

An air motor drives the hydraulic

pump for remote control of the boom and for drill positioning by one man.

An electric generator, air motor-driven, supplies three lights that flood the working face and the drilling operation.

Ripper for Grader

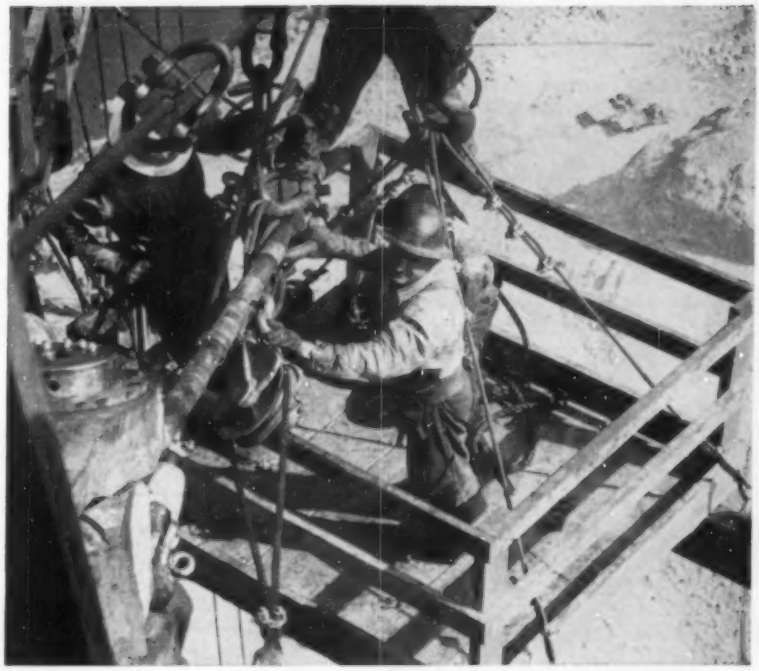
Manufacturer: Swanson Mfg. Co., 516 63rd St., San Diego 14, Calif.

Claims: The Swanson ripper is a new tool designed to rip outside of the width of the wheels or outside the cutting width of the blade of a motor grader. The ripper is actually a specially-designed attachment support boot which holds a standard-make of ripper shank while the work is being performed.

The new tool will effectively rip asphalt, hard pan, stratified rock, shale, adobe and concrete of reasonable thickness. It is now being manufactured in two models—the No. 10 and No. 12—for use with the Caterpiller No. 12 motor grader. Both models can be used with equal effectiveness on either the right or left side of the machine by reversing the tool, which is attached to the motor grader moldboard frame. When the model 10 ripper is not in use, the ripper shank can be inserted with the ripper point up and out of the way. The model 20 is designed so that the attachment support boot is movable on the moldboard frame; it slides over when not in use. This feature allows it to be carried permanently on the motor grader.

Basic specifications of the models 10 and 20 are the same. Maximum ripping depth is 10 feet. The attachment has a height of 15 inches and a breadth of 10 inches. It is of welded steel construction. An insert-type locking plug firmly holds the attachment in position. Standard

Continued on page 54



WORKERS RELY ON CROSBY CLIPS

THIMBLES INCREASE ROPE LIFE, SAFETY

Unless protected by a thimble, wire rope can be seriously damaged by heavy lifts that crush the strands at the load point. A light thimble can collapse and damage the rope. For positive rope protection and safety, specify Crosby Laughlin heavy plow steel thimbles with the extra heavy steel section design that stands up under maximum loads. Plow Steel Thimbles are available in sizes to fit ¼" to 2¼" wire rope. Stainless Steel Thimbles are offered in selected sizes.

Rigging a cable way 600 feet in the air demands the best fittings available to protect men and materials. This crew is assured of maximum safety because their work platform is secured with genuine Crosby* Clips. This clip, quickly identified by the "Red U-Bolt*" is the number one choice on every job where maximum safety and holding power is essential. Look for the red U-bolt—you'll see it securing wire rope in every industry! And Crosby is the *only clip* available in sizes to fit every rope from ⅛" to 3"! Proved design and quality controlled manufacture—finest steel, drop forged base, galvanized—results in consistently reliable performance.

From one source, Crosby Laughlin Lebus, you get the world's most complete line of fittings: Crosby Clips and "Load Rated" Blocks; Crosby-Laughlin drop forged shackles, hooks, Missing Links*, turnbuckles, thimbles, and other fittings; famous drop forged Lebus Loadbinders and drop forged Snatchblocks! Your Crosby Laughlin Lebus Distributor is your one stop fittings supplier—see him next time you need *any* fittings!

*REGISTERED TRADEMARK

Stocked and sold by leading distributors everywhere

CROSBY-LAUGHLIN *Division*

FT. WAYNE 1, INDIANA

New Equipment . . .

Continued from page 53

1 x 3-in. rippers are used. The model 10 weighs 50 pounds and the model 20 weighs 67 pounds.

9.5-yd. A-C Scraper

Manufacturer: Allis-Chalmers Mfg. Co., Tractor Group, Milwaukee, Wis.

Claims: The hydraulic model TS-160, with a capacity of 7 cubic yards struck and 9.5 yards heaped, has been added to the Allis-Chalmers line of motor scrapers. The new model is rated at 155 hp.

The TS-160 has an Allis-Chalmers 6-cylinder, 516-cu. in. displacement, supercharged-diesel engine rated 155 hp at 2,200 rpm. A one-piece all-steel tractor frame gives rigid support for engine, clutch and transmission and provides easy accessibility to these components for service. The final drive housing is an all-steel, precision-welded structure that is stress-relieved and line-bored for

true alignment of all gears, shafts and bearings.

Five-speed constant-mesh transmission fully utilizes the high torque output from the engine. Forward speeds range from 3.1 to 25.4 mph. Reverse speed is 3.1 mph.

The TS-160 carries 66% of its weight on the drive wheels when empty and has equal weight distribution on all four wheels when loaded.

Two-speed hydraulic steering with 90° steer each way is a feature. The tractor can swing into a right-angle turn with only a ⅛ turn of the steering wheel. A complete non-stop turn is made in 24 feet 8½ inches. A slight turn of the steering wheel regulates the pump flow to the steering jacks.

A relief valve in the steering system protects the hydraulic system from excessive shock loads if one of the tractor wheels hits an obstruction.

Two double-acting bowl lift jacks exert down pressure at the cutting edge. Three-piece cutting edges are interchangeable and reversible.

The low-wide-bowl design features a curved one-piece steel bowl bottom.

"I'm sorry, dear, but by the time I celebrated my raise with the boys, I came out $12 short of my regular pay."

Apron opening of the bowl is 83½ inches; width of cut is 97½ inches. Depth of cut ranges from 0 to 24¾ inches; depth of spread is 0 to 16⅝ inches. Height of bowl sides is 44 inches.

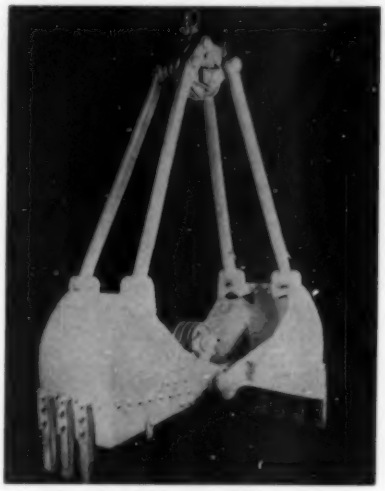
All controls, including the hydraulic scraper controls, are within easy reach of the operator. One lever raises and lowers the bowl and another provides instant and positive control of the apron and ejector.

An adjustable bucket-type foam rubber seat has three heights and several position adjustments. A heavy-duty, all-steel cab is offered as optional equipment. Four-wheel air brakes increase safe operation. A disc-type, 16-in. hand brake for parking is optional.

Hutton Clam Buckets

Manufacturer: Hutton Fabricating

Continued on page 58



It's a Bucyrus-Erie Rock Grab for Speed – Safety – Strength

SPEEDY PICKUP — Bucyrus-Erie rock grabs pick up assorted sizes and shapes quickly — without need for drilling dog holes or jacking up rock to place slings.

SOLID GRABS — Rocks are held firmly by the jaws through action of the multiple-part rope hitch — the heavier the lift, the more secure the grip.

STRENGTH IN RESERVE — All Bucyrus-Erie rock grabs are conservatively rated — available in five sizes — 2½ to 20 tons capacity.

Investigate the speed and safety advantages of these dependable rock grabs. See your Bucyrus-Erie distributor. 29R57C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

HEAVY CONSTRUCTION • SHORE PROTECTION • BREAKWATERS

this is the **TS-360**

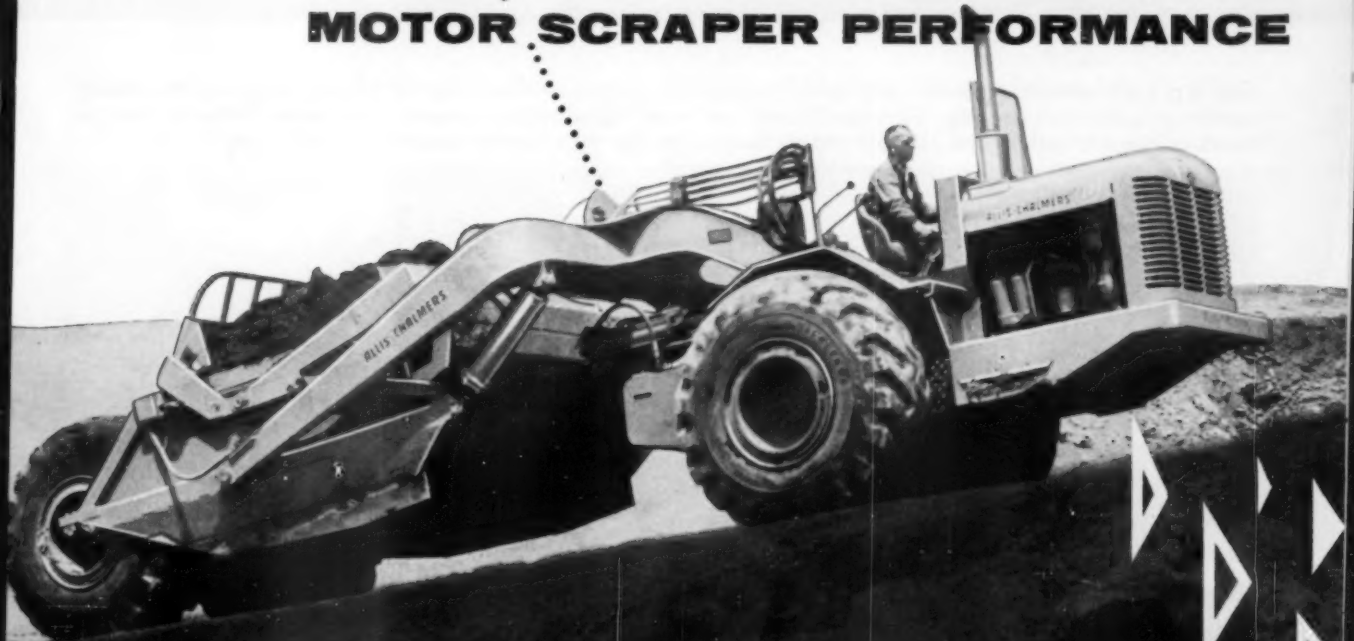
15 yd struck
20 yd heaped
280 horsepower

this is the **TS-260**

11 yd struck
14 yd heaped
200 horsepower

now...

ALLIS-CHALMERS BRINGS YOU ANOTHER NEW MEASURE OF MOTOR SCRAPER PERFORMANCE



the TS-160

NEW Allis-Chalmers TS-160

7 yd struck

9.5 yd heaped

155 horsepower

5 speeds to 25.4 mph

12-ton payload

Measure these advantages for

22 hp per struck yard—Big Allis-Chalmers supercharged diesel engine delivers extra lugging ability for tough pulls, fast loading. Versatile TS-160 can team up with big equipment or work alone on long- or short-haul construction jobs—handle a wide range of utility jobs, travel at speeds up to 25.4 mph.

Measure these features . . . Allis-Chalmers 516-cu-in. diesel engine—dependable power at all working speeds • Independent, constant live hydraulic power for steering and scraper operation • Low, wide bowl—8-ft, 1½-in. cutting edge . . . 3-piece, interchangeable cutting edges . . . double-acting hydraulic bowl lift jacks • Positive hydraulic ejection, high apron lift to full 7-ft, 1½-in. opening • Roomy operator's compartment, easy-to-reach controls, 24-volt direct electric starting, adjustable bucket-type seat, synchronized 4-wheel air brakes • Big push block for all types of pushers—positioned for in-line push • Full-circle visibility while loading, spreading and traveling . . . operating ease under all conditions • 17¼-in. minimum ground clearance in hauling position.

a wide range of construction jobs . . .

Turns non-stop in less than 25 ft with 90-degree hydraulic steering . . . easy maneuverability in narrow cuts, faster cycles without reversing in tight turn-arounds.

Moves quickly from job to job . . . when required, transport wheels are available to meet legal load limits for highway travel.

Allis-Chalmers, Construction Machinery Division
Milwaukee 1, Wisconsin

ALLIS-CHALMERS

Engineering in Action

GENTLEMEN: Have the Allis-Chalmers Construction Machinery dealer serving my area arrange a demonstration of the TS-160 motor scraper for me ☐.

Name_____

Address_____

City_____ State_____

Type of work_____

ARCAIR TORCH CUTS STEEL PILING WITH BACKFILL IN PLACE... SAVES 50%

Fifty-year-old ⅜" steel piling was cut into convenient lengths by the Arcair Model H-3 Torch with backfill dirt and concrete still in place. The contractor saved 50% on cutting costs and saved more because he had bulldozers and pneumatic chipping hammers on the job only two days instead of ten. The Arcair Torch and Copperclad Electrodes used ordinary DC welding machines for a power source and common 100 psi air pressure to cut thousands of feet of piling during the replacement of a Chicago & Northwestern Railway bridge in Evanston, Illinois.

For full details on this project, and for complete information on the cost and time-saving Arcair Model H-3 Torch, write today.

Arcair **Company**

458 S. Mt. Pleasant St., • Lancaster, Ohio

New Equipment . . .

Continued from page 54

Mfg. Corp., 2736 E. 79th St., Cleveland 4, Ohio.

Claims: Hutton has developed a new line of clamshell buckets for excavating, dredging and materials handling operations.

Called the Hutton Pelican line, these buckets feature carefully-calculated inside and outside arm lengths. This and the proper distribution of weight and a unique pulley design provide a bucket that opens and closes fast.

The cutting teeth and cutting lip are forged of T-1 steel. The shells and head are of all-welded construction.

Hutton buckets have block and tackle-type reeving. Buckets can be furnished with bottom teeth or with bottom and side teeth.

All component parts are interchangeable in five different sizes.

Self-Priming Pump

Manufacturer: McGowan Pumps, 58 Central Ave., Cincinnati 2, Ohio.

Claims: A newly improved McGowan heavy-duty self-priming pump gives much higher capacity than its previous model. Replacing the former 15M, the

new model uses an improved spring-loaded lubricator for the seal, requiring less frequent attention in operation. It is easy to start, and requires a minimum of maintenance.

The pump's case has been redesigned for greater hydraulic efficiency. Corners have been eliminated to provide less turbulence and smoother flow. The pump is available wheel-mounted, and can be furnished with a high-speed trailer hitch.

Nichols . . .

Continued from page 37

scrapers, a Cleveland ditcher and a Cat D7 with sideboom for pipelining.

Much use inside plants is found for a Ford FMD tractor equipped with a front-end loader, backhoe attachment and outriggers. Four International T-9 center-boom tractors are used for close work inside plants. A small Fordson tractor pulls compactors.

Nichols has more than 200 welding machines—Lincolns and Westinghouses—seemingly enough to weld a pipeline around the world. About a dozen Schramm, Gardner-Denver and Ingersoll-Rand compressors, ranging in size from 105 to 600 cfm, are also available.

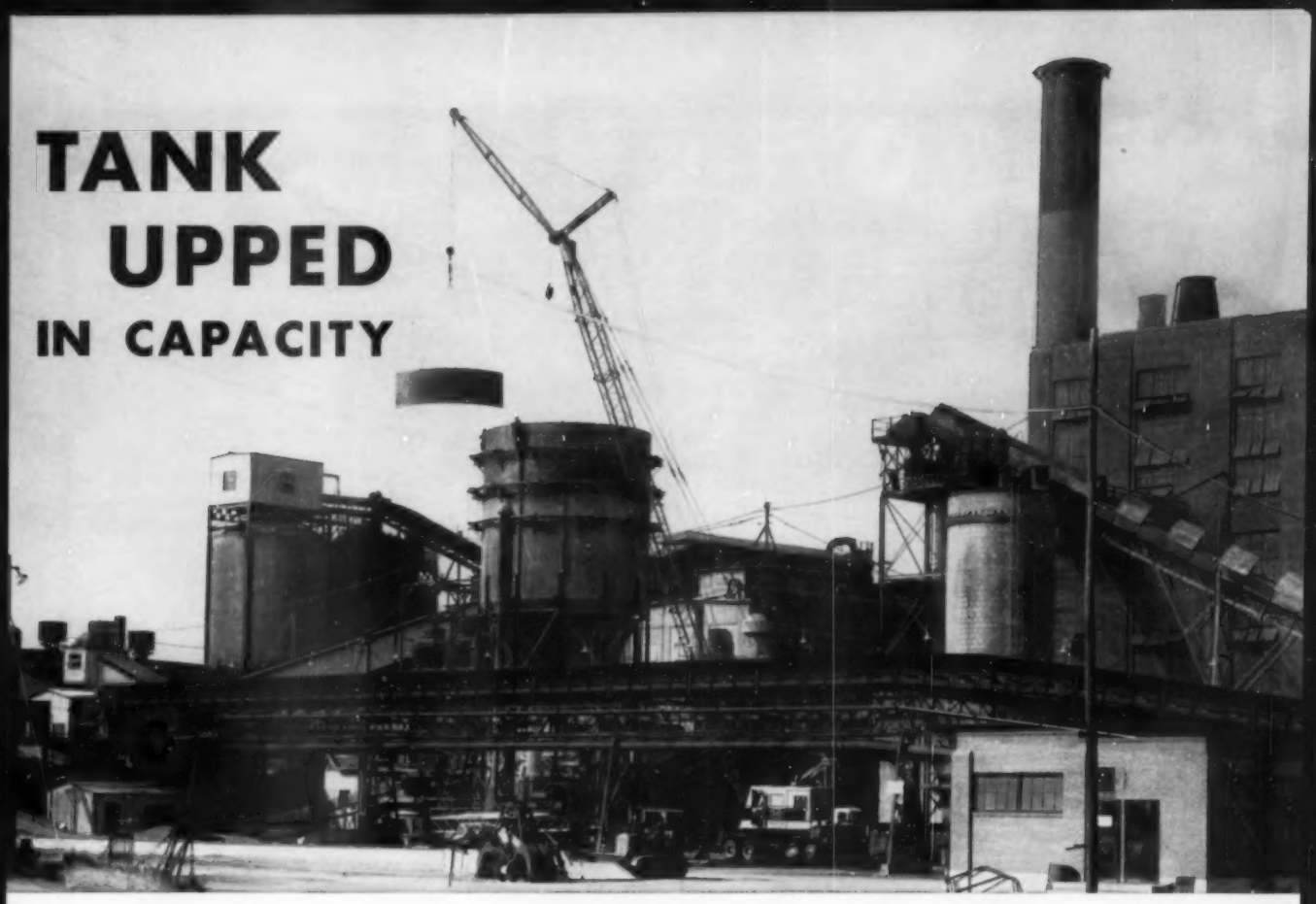
Complete repair facilities are maintained by Nichols at its five-acre office-garage site located on Baton Rouge's busy Airline Highway. The firm employs both automotive and heavy diesel mechanics.

Nichols, now 48, was in oil field operations before he formed his own company. He is active in the business and keeps in touch with key personnel with the help of a two-way Motorola radio system with 12 units.

Nichols is president of the company. Bert S. Turner is assistant to the president. C. J. Melancon is vice-president in charge of the equipment division and his assistant is A. B. O'Quin. C. W. Guy is manager of the construction and engineering division; his assistant is L. C. Cunningham. R. B. Prestridge is head of the engineering and estimating group. Leo Nijoka is assistant office manager.

J. Y. Sherburne, B. A. Taber, L. E. Rutland, W. L. Coker, E. S. Odom, W. A. Smith, W. W. Ballard and F. B. O'Neil are field superintendents.

"Knock again. I'm sure he's in."



Four-Axle Truck Crane Helps Raise Sides of Lime Tank at Pulp Mill

This maze of conveyors, pipes, stacks and tanks is representative of today's American industry—industry that is continually expanding. And the truck crane in the middle of this maze is representative of the modern machines which make expansion possible.

The job site?—a pulp mill in Virginia. The job?—lift steel tank parts into place, some of them weighing as much as seven tons. Machine chosen for the job?—a Marion 43-M Truck Crane.

Largest truck crane in Virginia, at the time it was delivered, the maneuverable 43-M was driven 40 miles to the job site from the owner's headquarters in Richmond. The heavy-duty machine was quickly equipped with a 100-foot boom and 30-foot jib and was soon lifting steel plates into position as fast as the assembly crew could handle them. It worked 12 hours a day.

Four-axle stability was important on this job where the lifts were high and had to be made at a sharp boom angle. The owner praised Marionair Control which made it easy to handle and spot the heavy plates. He particularly likes the 43-M Truck Crane's large-size drums.

A modern Marion can help your company grow, too. Get the story from your Marion distributor. Find out about today's 40-ton 43-M Truck Crane.

MACHINE	Shovel Capacity	AVAILABLE AS . . .			
		Hoe	Crawler Crane	Truck Crane	Special Crane
35-M	¾	Yes	Yes	Yes	—
43-M	1	Yes	Yes	Yes	—
362	1½	Yes	Yes	—	Yes
87-M	—	—	Yes	—	Yes
93-M	2½	Yes	Yes	—	Yes
101-M	3	—	Yes	—	—
111-M	4	—	Yes	—	—

MARION **POWER SHOVEL COMPANY**
A Division of Universal Marion Corporation
Marion, Ohio

SEND ME information about **MARION** ..... yard shovels, ... yard hoes and ..... ton cranes (☐ crawler mounted ☐ truck mounted). ☐ Have a salesman call.

NAME ..... TITLE .....

COMPANY .....

STREET .....

CITY ..... ZONE ..... STATE .....

NOT in the Contract

A young father was pushing a baby carriage in which an infant was screaming. Wheeling the howling baby along, he kept murmuring gently, "Easy now, Donald. Keep calm, Donald. Steady, boy. It's all right, Donald."

A mother passing by paused to say, "You certainly know how to talk to an upset child—quietly and gently." Then, leaning over the carriage, she said, "What seems to be the trouble, Donald?"

"Oh, no," said the father. "He's Henry. I'm Donald."

Two golfers, strangers to each other, happened to meet on the golf links.

"See that girl over there?" said one. "Imagine her parents allowing her to appear in clothes like that. Just copying men's clothes."

"That, sir, is my daughter," said the second golfer.

"Oh pardon, me, I'm sorry. I didn't know you were her father."

"I'm not. I'm her mother."

A Texas rancher traded his Cadillac in on a new Rolls Royce. A few weeks later he brought the car in for servicing.

"Do you like it all right?" asked the salesman.

"Oh, it's fine. I especially like that glass partition between the front and back seat."

"You do?"

"Yeah, keeps the cows from licking my neck when I'm taking them to the stock shows."

Mama Gnu was waiting for Papa Gnu as he came home for dinner one evening.

"Our little boy was very bad today," she declared. "I want you to punish him."

"Oh, no," said Papa Gnu. "I won't punish him. You'll have to learn to paddle your own Gnu."

Sailor and a girl were riding on horseback out in the country. As they stopped for a rest, the horses rubbed necks affectionately. "Ah, me," said the sailor, "that's what I'd like to do."

"Go ahead,' said the girl. "It's your horse."

A young lady, telephoning a music store, was connected with a garage by mistake.

"Do you have *Two Red Lips and Seven Kisses*?"

"No," came the reply. "But we have two tom cats and seven kittens."

"Is that a record?" she asked.

"Well," said the garage, "we think it is."

A student reporter on a high school paper covering a class play, hit the literary jackpot when he wrote:

"The high school auditorium was filled with expectant mothers eagerly awaiting the appearance of their offspring."

A woman went to a medium and got into contact with her dead husband.

"James" she asked, "Are you happy now?"

"I am very happy."

"Are you happier than you were with me on earth?"

"Yes, far happier," came the sepulchral voice.

"Tell me, James, what is it like in Heaven?"

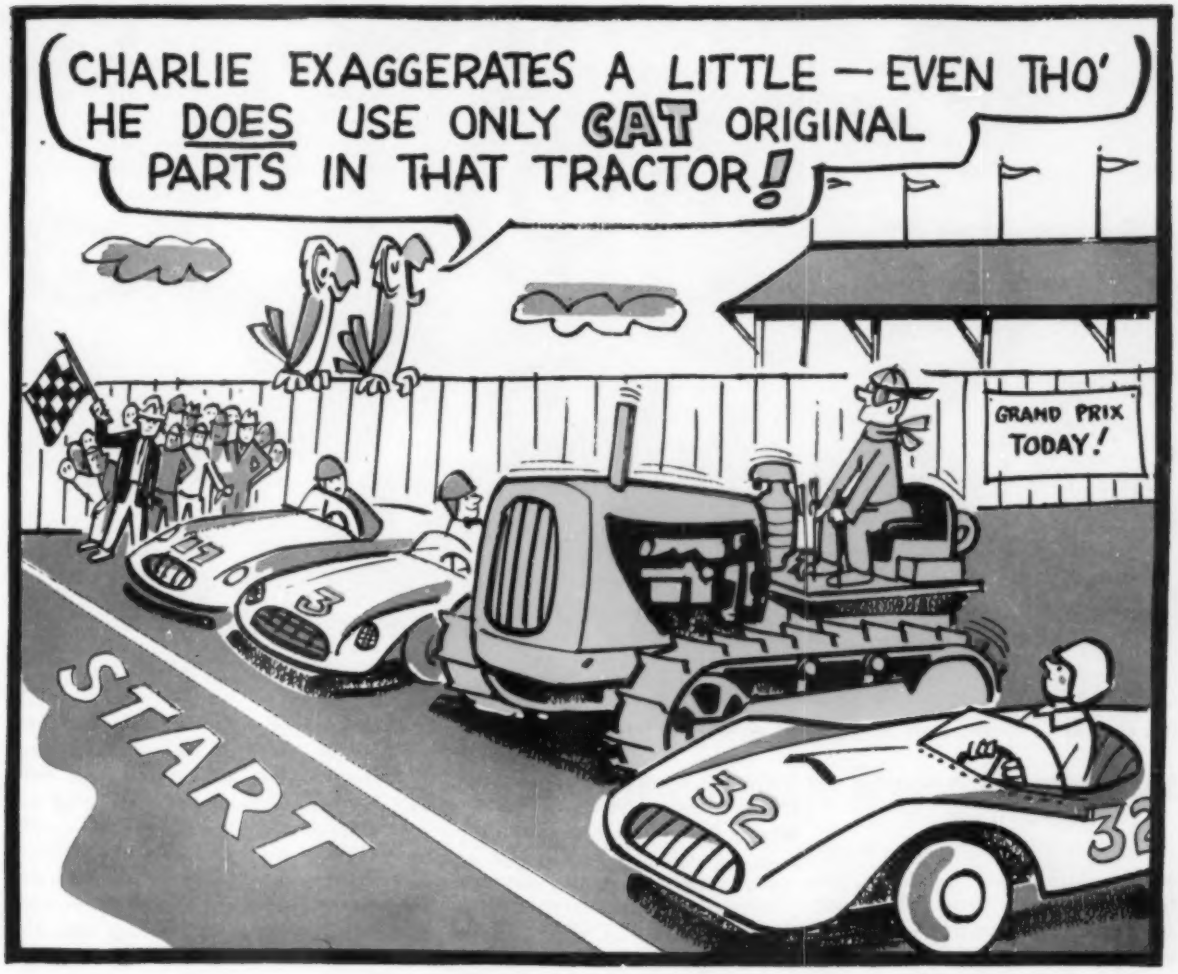
"Heaven!" the voice said, "who's in Heaven?"

"I'm frightfully upset about my husband," a woman told the psychiatrist. "He blows smoke through his nose."

"Why, it's nothing out of the ordinary for a man to blow smoke through his nose!"

"But, doctor," the woman screamed, "my husband doesn't smoke!"

Woman fishing: "Have you another cork, dear? This one keeps sinking."



Are they really as much alike as they look? Steel used in industrial standard bolts must withstand 120,000 pounds pull per square inch—CAT* bolts must withstand *at least* 151,000 PSI. Same with other Cat original track parts—higher standards. With "look-alike" track parts, who knows? Be sure to get parts you can trust—from your Caterpillar Dealer. He always has *exactly* the part you need. Call on him anytime.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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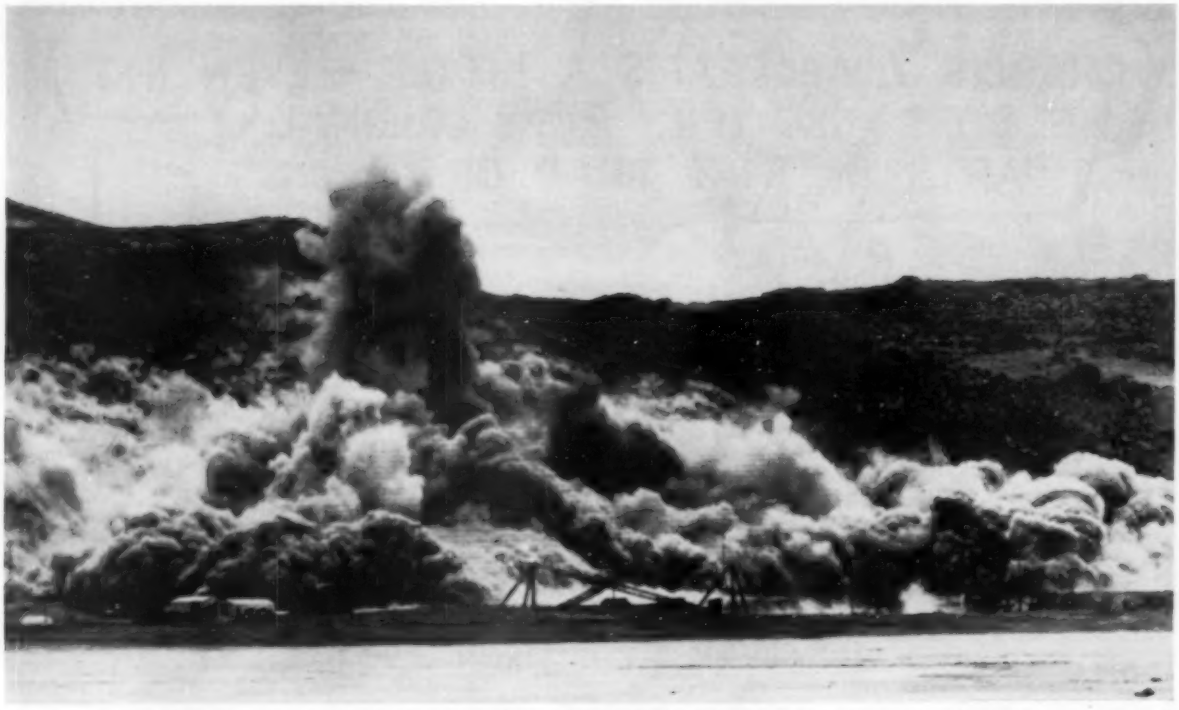


This blast of 1,790,000 pounds of explosives at Little Valley, Utah, by M-K on July 21 loosened 1.6 million cubic yards of rock.

Salt Lake . . .

Continued from page 27

an engineer. A method has been worked out in which survey towers are positioned on each side of the embankment, and a string of targets is set above water level on a cross cable connecting two towers. By lining up on the proper targets and checking positions occasionally by cross-intersecting transits or sextant shots, the material is dumped on the proper location. Raytheon fathometers are used for underwater surveys to control the dumping.

One of the principal features of interest regarding quarry No. 2 is an unusually effective method of blasting the high rock face. A scheme was worked out in which two 6 x 7-ft. main tunnels, approximately 1,300 feet apart, are being drilled straight into the side of a mountain. These are access tunnels pure and simple, and a method of blasting has been worked out so that even the explosion of 1,790,000 pounds of powder in one shot is not expected to damage the tunnel walls materially. On a 972,000-lb. explosion, the walls of these access tunnels were scarcely raveled.

From this main tunnel at 100-ft. intervals, cross-connecting tunnels of approximately the same size lead off perpendicularly. These drifts extend out a sufficient distance to leave only a 40-ft. pillar of undrilled rock in the center of each pair of laterals. The tunnels are being drilled by a small jumbo-mounted set of two Gardner-Denver mining stopers, with the jumbo mounted on a narrow-gauge railroad track. The rock is primarily quartz with a 70-plus percentage of silica, so the use of tungsten-carbide-tipped Timken rock bits is necessary. In fact, the extremely hard drilling nature of this quartzite ruled out the use of large-diameter churn drills working from the top.

Tunnelmen drill a 24-hole face pattern, use delays and gelatin-type powder, and are pulling 6-ft. average rounds at each shot. The broken material is then loaded out by an Eimco B-12 mucker

Here is a closeup of the resulting muck pile produced by Atlas Amocol blasting agent and 60% extra dynamite placed in a bank 1,300 feet long and 200 feet high.

and is hauled away to a dumpground by trainloads of ten 2-yd. cars pulled by Mancha and Atlas locomotives.

The huge powder shots consist of Atlas ammonium-nitrate powder, together with approximately 20% of Atlas, Hercules and DuPont conventional explosives. The powder is piled in the cross-connecting tunnel drifts, beginning with a pocket at the ends of each tunnel. This powder breaks out the untunneled rock portion. After powder pockets are piled high, a small special agricultural-type loader throws special sand backfill tight in over the top of the powder and against the roof of the tunnel. Between pockets of powder, blocks of sand backfill are placed, with all powder pockets connected by two lines of reinforced Primacord. On powder loading, the crew can fill about 100 feet of tunnel per shift.

Safeguard Tunnels

The factor which prevents blast damage to the main-access tunnel walls is the method of loading powder in the cross drifts to a point within approximately 130 feet of the main tunnels. From that point back to the main tunnel, sand is heavily backfilled in solid form. When the shot goes off, the high face breaks out, leaving the access tunnels relatively intact. On a near million-cubic-yard shot, it took a crew only a few days to clean out the tunnel so that new advances and cross drifts could be made for the next shot.

Recently, a 1,790,000-lb. explosive shot was pulled in quarry No. 2. Officials estimated that the shot cost approximately $150,000 for powder alone. Exploded by two Primacord trunklines, the blast rolled down approximately 1,600,000 cubic yards of rock for the big barrier.

Shovel loading at quarry No. 2 is being handled by two new Bucyrus-Erie 150-B power shovels, rigged with 6½-yd. Esco dippers and teeth. Hauling units under these shovels include eight 17-yd. end-dump Euclid trucks, which haul to barges.

Quarry No. 1, also a rock production point, is a more typical example of the conventional coyote method. Here, M-K is drilling coyote tunnels 150 feet apart, with approximate 50-ft. cross-connecting T's. In this case, both the main tunnel and the T's are being loaded with the same type of powder on a similar one-pound-per-cubic-yard explosive ratio as in the previous quarry.

To drill these tunnels, the miners are

Got A Tough Digging Job?

● SOFT GROUND

● DEEP WATER

● NARROW SPACE

● STEEP HILLS

Use A Sauerman DragScraper

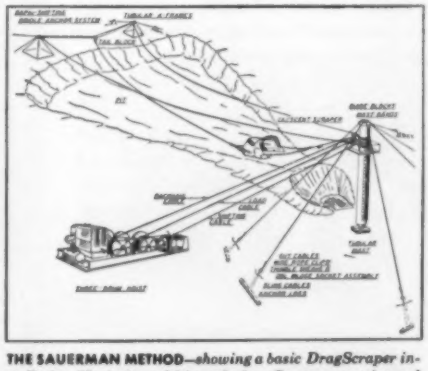
● **SOFT GROUND**—Sauerman DragScrapers work on surfaces where wheeled equipment cannot go and where mats are required to operate a dragline. The DragScraper digs and hauls its load quickly at ground level to hopper or pile. It carries a payload of two to three times its weight. You are not paying the power costs of a heavy machine with a handling capacity that is just a small portion of its weight.

● **NARROW SPACE**—A DragScraper can be operated through an opening no larger than the bucket's width. They are used successfully in culverts, sewers, tunnels, under bridges and buildings. Locations with limited space and head room . . . unworkable with other equipment . . . are handled efficiently and economically with a DragScraper.

● **DEEP WATER**—A Sauerman DragScraper will dig as much as 100 ft. below water . . . this is far below the safe depth that a dragline bucket can go without the danger of undermining and overturning the machine. Use a DragScraper for trenching, digging channels, lakes or for beach construction.

● **STEEP HILLS**—These are routine for a DragScraper. Material can be taken from anywhere on the bank. Digging from the top of the slope eliminates cave-ins—and the DragScraper gives an extra bonus by pushing additional material in front of the bucket on its way down the slope.

The Sauerman DragScraper operator and hoist is always located away from any hazardous area. It is designed for years of safe, continuous duty, handling bucket sizes up to 15-cu. yds. over spans to 1000 ft. or more.



THE SAUERMAN METHOD—*showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

When you have a "tough-to-handle" job consult Sauerman engineers about Sauerman equipment and the Sauerman Method. Request Catalog A, also the Sauerman News and field reports.

SAUERMAN BROS., INC. 622 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

Easy does it! Shovel operator tips a big rock gently into the truck bed. Quarry-run rock will be placed in upper portion of fill.

using a slusher system, consisting of two Ingersoll-Rand air-tugger hoists and a Gardner-Denver 600-cfm rotary air compressor. Drilling is being done by three Thor jackleg-type drills, using Timken tungsten-carbide bits which bottom-in at 1½-in. diameter. A 16-hole round is being used with delays to pull approximately five feet per blast. When the main tunnels have reached a distance of approximately 100 feet into the hillside, the mains and cross-connects then are loaded with ammonium-nitrate and regular powder and detonated in the same manner used in quarry No. 2.

Loading equipment at quarry No. 1 includes a new Bucyrus-Erie 150-B shovel with a 6½-yd. Esco dipper and teeth. Hauling units under this shovel include part of the fleet of 15 to 17-yd. end-dump trucks used in quarry No. 2. These trucks are rotated between the shovels as necessary.

End Dump Rock

The Eucs haul the random rock fill out to the railroad embankment and end-dump it off the end. The fill is being built in this manner up to approximately three feet above water surface, leaving convenient turnaround points every 200 feet or so for convenience of the Eucs. After being built to this elevation, the fill will be allowed to settle for a year or so, thus stabilizing the foundation material to some extent in preparation for tremendous additional weights of material which will be built up as the fill nears its final height.

Lakeside quarry on the west shore of the lake is so far a secondary operation. Instead of quartzite, the rock formation here is limestone, and a coyote-hole method of drilling and shooting similar to the previous quarry is in use. The loading shovel here is a Bucyrus-Erie 88-B with a 4-yd. dipper. Railroad tracks, carried right up to the shovel, carry 16-car trains. Direct shovel loading to the 30-yd. cars is practiced. A

R. M. Conner (left), of Atlas Powder Co., talks over problem of blasting coyote holes at Quarry No. 1 with miners Dewey Johnson, Fred Anderson and M. W. Ball.

side-dumping method is being used to dump the cars, and the earthfill developed by the dump is being smoothed out by Caterpillar dozers.

M-K has developed its own camp site, and the entire project is governed by a rigid safety program enforced by supervisors and a full-time safety engineer.

The camp consists of mess hall, barracks, a barber shop and recreation center, houses, trailer-parking facilities, a supermarket, post office, a schoolhouse and practically all the other conveniences of a full-fledged town community. The job site also has an airstrip which does a land-office business, since many of the men commute by air each day. There is regularly scheduled air-taxi service, and the trip from Salt Lake City or Ogden takes only 20 to 25 minutes. There is a state secondary highway out to Promontory Point, but it is 92 miles from Ogden and the road is rough and potholed. Some reconstruction work now is under way, but the job is still remote by road.

A 17-yd. truck end dumps rock fill off the end of the earthfill embankment. Fill is built up to three feet above water, leaving turnaround points for the trucks every 200 feet.

Emphasize Safety

The safety program, rigidly enforced, has built up an enviable record. Now over a year old, the project rates as one of the safest in all of Morrison-Knudsen's operations. Safety meetings with all supervisors are held regularly each two weeks. Safety rules are a practical, common sense combination of normal precautions coupled with enforcement of safety rules as outlined by the Associated General Contractors and state regulations.

An interesting study has been conducted—and corrective measures taken—to save money by reducing the number of doctor cases caused by minor injuries. Every injury, no matter how minor—blisters, scratches, and splinters—must be reported by sending the injured man into the first-aid office at the job. Prompt first-aid treatment here prevents infection, and very frequently stops a doctor case before it starts.

The Salt Lake Crossing project is under the general supervision of O'Dean Anderson, project manager, who is assisted by D. R. Bagley, project engineer; Robert K. Woodhead, office manager; F. W. Currey, marine superintendent; and Elmer Riggan, master mechanic. H. J. Willard is resident engineer for Southern Pacific. All design work for the causeway was directed by International Engineering Co., Inc., an M-K subsidiary.

Cat dozer levels off the rock fill. Material will be allowed to settle for about a year to prepare for capping with derrick stone.

How a cost-beating, can "unbind"

A TD-24 starts and gets "ready to run," seconds-fast. Morning, noon, or any other time you shut down the TD-24's diesel engine, you restart in seconds—and save yard-moving, wage-costing minutes! Exclusive International gasoline-conversion diesel starting does it—and the combustion-heated engine is ready to run as a diesel, without "gumming the works" with raw fuel!

TD-24 Cerametallic engine clutch eliminates time loss and upkeep cost of temperature-sensitive, "service-nervous" type clutches! You get the simplicity of long-familiar clutch design. You get the operating ease, temperature-immunity, and power-transfer efficiency of International Cerametallic facings. You get the instant readiness to operate perfectly when cold —plus heat-defiance for clutch-mauling jobs like 'round-the-clock shuttle-dozing.

TD-24 on-the-go shifting is a "double-barreled" cycle-speeder. The exclusive TD-24 two-speed planetary system gives instant, stall-preventing Hi-Lo shifting without declutching, in either the Torque-Converter or Gear-Drive models. And in the Gear-Drive model, you get two-direction "no-stop" shifting with exclusive synchromesh transmission.

TD-24 exclusive Planet Power steering eliminates load-limiting "dead-track drag"—gives full-time "live" profit power on both tracks. It's more than total engine hp or weight that

"The TD-24's 2-speed track steering holds you in 'dozing position with no slide-slip or power loss in turning," states Operator Jack Campbell for Owner J. H. Marshall, Clovis, New Mexico. The Marshall TD-24 is shown dozing tough caliche rock for road surfacing.

cycle-speeding TD-24 your profit squeeze!

Flores and Perry, Laton, California, depend upon three International "75" Payscraper® units and a TD-24 Torque-Converter crawler—to fulfill their 8-mile grade-raising subcontract, on Central Valley Highway south of Hanford. TD-24 push helps boil-in 20 cu yd heap-loads, in only 42 seconds!

counts—watch how "dead-track drag" limits any king-sized steering-clutch crawler to what it can handle on turns. Then watch how years-proved Planet Power steering gives the TD-24 full-time, both-track power—to pull or push extra-big loads on the turns or straight ahead, uphill or down!

TD-24 control ease puts record daily production at your operator's fingertips. Cool and safe flush-deck design, control-tower vision, and reach-easy fingertip controls all increase operator comfort and performance. Never before has big crawler work-power been so load-responsive—or record work-production so easy to achieve!

Prove positively your profit-margin widens—with geared-and-steered-for-action TD-24 power giving you the success-margin of push or pull! See your International Construction Equipment Distributor for a TD-24 demonstration!

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

FOR 50 YEARS...
Finest in the Field!
Ask the contractors who use the Omaha Dragline Buckets. Learn how its wedge shape makes easier loading and emptying...its perfect balance for smoother carrying and dumping . . . its smoother interior, high arch, continuous lip makes it your best buy. Extra strength is built in at every point of strain.
Strike pay dirt now! Complete information and specifications await your letter.
DRAKE-WILLIAMS MOUNT
• OMAHA, NEBR.
OMAHA
DRAGLINE BUCKETS

New Trade Literature

Subject: **Schramm Air Compressor**

Content: Schramm's Pneumatractor, a combination 125-cfm air compressor and wheel tractor which can be converted from one service to the other by a button on the instrument panel, is described and illustrated in a six-page bulletin, *No Contractor Can Afford to be Without Self-Propelled Air Compressors.* Photographs show 18 different ways that contractors can use the Pneumatractor. Detailed specifications are given for both the standard and the heavy Pneumatractor. Available accessories are listed.

Where to get: Schramm, Inc., 900 E. Virginia Ave., West Chester, Pa.

Subject: **Self-Propelled Scraper**

Content: Latest engineering developments on the model 55 Payscraper are described in an 8-page booklet. Close-up photos of such important features as the improved bowl, three-piece reversible cutting blades, and "flow system" of positive power steering, show why the 14-yd. self-propelled unit is easily operated and has maximum safety and long-life durability. On-the-job photos illustrate the maximum stability of the unit through such things as ground-clinging traction, adequate ground clearance and strain-free turning. Brief specifications are listed. Ask for booklet CR-525-G.

Where to get: Construction Equipment Div., International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Explosives Data**

Content: Facts and figures to help users of explosives, as well as a description of the Atlas line of explosive products, are included in a 48-page catalog. Containing more than a score of tables and over 100 illustrations, the book helps select explosives for strip and underground coal and metal mining, quarrying, construction, seismic prospecting, pipelining, agriculture, lumbering and other industries. Over 150 items are listed in the catalog section. Complete information, in text and tabular form, is included to describe the properties and appropriate areas of application of 18 types of high explosives, six low-order blasting agents, blasting caps, blasting machines, safety fuse and other blasting accessories and supplies.

Where to get: Explosives Div., Atlas Powder Co., Wilmington 99, Del.

Subject: **Tractor Parts**

Content: Are all lubricating oil filter elements just about the same? Won't most any filter element trap impurities? And why use filters at all when additive oils are supposed to keep engine parts clean? The answers to these questions are found in a new eight-page Caterpillar booklet, *Have You Been Around When Your Engine's Torn Down?* Drawings and photographs show the effects of varnishes, sludge and abrasive particles on critical engine parts. Text explains the functions of detergent oils and their relation to filter elements. Cutaway views of these elements show components and diagram lubricating oil flow. A historical presentation of filter development illustrates step-by-step the advances made in filter design from the metal strainer type to the modern plastic-impregnated paper element. Ask for form DE732. The story of Cat track bolts and nuts is told in another booklet, *Hardwear Hardware.* This booklet discusses in detail the requirements track bolts and nuts must meet in order to give top performance under the most abusive conditions. Since nearly all track bolts and nuts look alike, the booklet shows how machine owners can make their own tests to determine which hardware is best. Ask for form DE720.

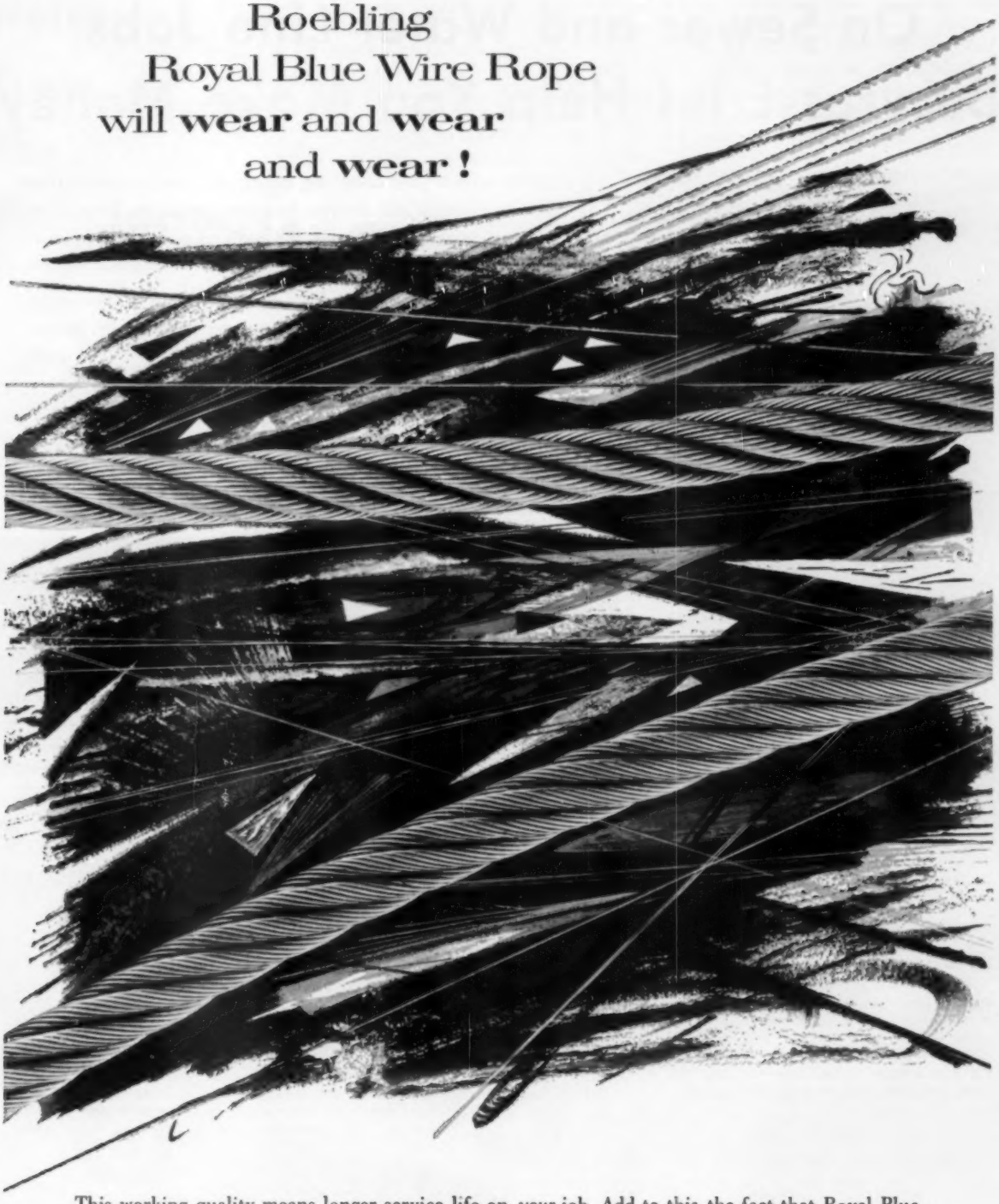
Where to get: Caterpillar dealers or Caterpillar Tractor Co., Peoria, Ill.

Subject: **Diesel Pile Hammers**

Content: A six-page bulletin describes McKiernan-Terry DE-20 and DE-30 diesel pile hammers. It also features the line of universal drive caps, developed specifically for use with the new pile hammers. Contents include details of the pile hammer operational features, such as mobility, time-saving, low operating costs and minimum maintenance. Technical specifications are listed for both models. Ask for bulletin 67R.

Where to get: Pile Hammer Div., McKiernan-Terry Corp., Dover, N. J.

Roebling Royal Blue Wire Rope will **wear** and **wear** and **wear**!



This working quality means longer service life on *your* job. Add to this the fact that Royal Blue is stronger than the strongest rope you have been using and you have two excellent reasons why it has enjoyed faster acceptance than any wire rope in Roebling's history. Your distributor or Roebling Sales Office will give you the complete story, or contact John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Distributors, Branches and Warehouses Throughout the Country—Subsidiary of The Colorado Fuel and Iron Corporation

On Sewer and Water Line Jobs
Bucyrus-Eries Help You Make Money

Whatever your trenching conditions, you can profit from the extra output of a Bucyrus-Erie hoe. From the ground up, these machines are designed and built to put power to work moving dirt with top efficiency.

Your nearby Bucyrus-Erie distributor will be glad to explain how these machines can improve your profit picture. See him soon. 327E57C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WIS.

15-B — *Trenching for new 12-in. sewer lines in Michigan, this ½-yd. 15-B hoe handled 20,000 cu. yds. of muck and wet soil for its owner, Union Construction, of Manchester.*

30-B — *This 1-yd. 30-B excavates for the installation of 36-in. concrete storm sewer pipe in a flood control project near Los Angeles, California. The machine is owned by the A B C Construction Co., Norwalk, Calif.*

22-B — *Trenching for a water main in Texas was made difficult by altitude, plenty of boulders, and considerable dust. But when this ¾-yd. 22-B was put on the job, work was completed quickly and economically. Foreman on the job reports the 22-B out-dug a new competitive hoe on the same job. Owner: El Paso Water Dept.*

38-B — *This 1½-yd. 38-B hoe excavated some 6,000 feet of trench for storm sewer installation in Ann Arbor, Michigan. The machine owner is Frank Siller, of Ann Arbor.*

Notes from the Manufacturers

American Manganese Steel Div., American Brake Shoe Co., New York, N. Y., has appointed Frank B. Falvey sales representative in New York. Falvey joined the company in 1956. He is a resident of Norwalk, Conn.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed three new distributors. Sanford Tractor & Equipment Co., Reno, Nev., will sell and service excavators in western and central Nevada and in northeastern California. Chapman Binder Machinery Co., Union, N. J., will handle excavators in the northern part of New Jersey and one county of New York. Both firms will carry the full line of ⅜ to 4-yd. convertible excavators and cranes; Transit Cranes; Hydrocranes; and dragline buckets. A third distributor, Pit & Quarry Equipment Co., Indianapolis, Ind., will sell and service Hydrocranes only. It will offer 5 and 10-ton truck-mounted, all-hydraulic Hydrocranes and the Hydrohoe, a hydraulically-operated dragshovel.

Caterpillar Tractor Co., Peoria, Ill., has appointed two earthmoving representatives. Emil E. Grob will work in the eastern sales division, serving dealers in Virginia, Maryland and North Carolina. He will work from Richmond, Va. Joseph M. Johnson will work in the southwest sales division. He has established residence at Santa Ana, Calif., and will serve as a consultant on earthmoving projects in Nevada, Utah, Arizona, California and Hawaii.

Eimco Corp., Salt Lake City, Utah, has named two sales and service representatives. Russell A. Lien, Crystal Falls, Mich., has been assigned to the Eimco branch at Duluth, Minn. He will handle mine loaders and construction tractors. Denny F. Warnock, Cincinnati, Ohio, will serve as a midwestern representative for the Eimco Model 105 tractor. He will be assigned to the Chicago regional office at Palatine, Ill.

L. B. Foster Co., Pittsburgh, Pa., has added Raymond J. Warren to the sales staff of its Chicago office. His sales territory includes Indiana, Michigan and Missouri. He is a graduate of Marquette University with a degree in civil engineering. Russell W. Yanicki has been added to the sales staff of the Pittsburgh office and will specialize in the development and sale of aluminum railing. He is a graduate of the University of Pittsburgh.

International Harvester Co., Construction Equipment Div., Chicago, Ill., has announced a new plan for selling used equipment through its distributors. The program is called VM (Value Measured) Used Equipment. Under the plan, International distributors will recondition or rebuild a used machine and then measure the value of each major component such as engine, transmission, clutch, tires or tracks, final drive and other vital areas. The value of these components is derived by estimating the condition of the part if it is acceptable as is, or by listing the repairs and their cost on component tags which the distributor attaches to the machine. After the VM used machine is put in the used equipment lot, the prospective buyer will check the condition or value of each component by reading the tags.

LeTourneau-Westinghouse Co., Peoria, Ill., has appointed D. H. (Don) Mitchell as eastern sales manager. Mitchell will be in charge of 21 eastern states and four Canadian provinces. He replaces James A. Vincent, who recently resigned to become vice president and general manager of Adams Construction Equipment Co., a new LeTourneau-Westinghouse distributorship being organized at Orlando and Miami, Fla.

H. K. Porter Co. (Canada) Ltd., Toronto, Ont., a wholly-owned subsidiary of H. K. Porter Co., Inc., has acquired the Federal Wire & Cable Co., Ltd., Guelph, Ont., Canada's fourth largest wire and cable concern.

Salem Tool Co., Salem, Ohio, has appointed Rish Equipment Co., Bluefield, W. Va., as sales representative in Ohio for the firm's line of McCarthy auger drills.

Seals . . .

Continued from page 33

leather or rubber, frequently has one lip which is wider than the other lip. In applications requiring such a double lip seal, the spring side of the seal, which has the wider lip, should always point toward the lubricant to be sealed. If two compartments containing lubricant are separated by a double lip seal, the wider lip should point toward the compartment containing the higher pressure or the compartment with the most fluid lubricant.

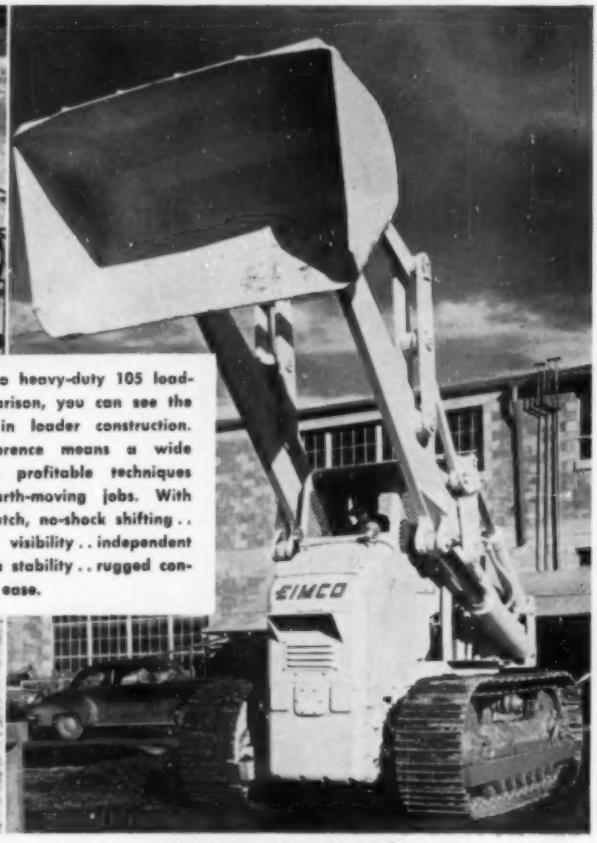
There are several ways to install lip-type seals. If the seal to be installed must pass over a sharp shoulder, keyway or spline, shim stock should be wrapped over these areas and the shim stock lubricated to provide a smooth, sliding surface for the seal lip. If shim stock is not available, a heavy paper coated with grease will work satisfactorily. To drive the seal in place, use a driving member that will press against the outside rim of the seal.

Another commonly used synthetic rubber seal is the O-ring seal. This seal should be dipped in oil just prior to installing and should be rolled over the shaft on which it is to be installed, or placed into its groove with a minimum of stretching. Also, make sure the O-ring is not twisted when it is placed in its groove. O-ring seals are inexpensive and, once used, conform to the shape of the groove in which they are installed. They are, therefore, usually replaced at disassembly and seldom reused except in an emergency.

Chevron-type packing seals are generally used in hydraulic cylinders. Direction of assembly is most important to effect a seal with this type of packing. In all applications, the chevron packing should be installed with the point of the chevron toward the flange or the piston. Installed in this manner, the lips of the packing will not catch on sharp edges. Always use sufficient shims behind the packing gland to give the chevron packing a slight press.

As previously pointed out, seals are normally small in size and cost very little; however, they play an important part in the life of earthmoving equipment. Leaking seals should always be replaced. Those found to be questionable at reconditioning should also be replaced to prevent future downtime and possible costly repairs.

ONLY EIMCO . . . OFFERS YOU THIS LOADER SELECTION



Here are Eimco's two heavy-duty 105 loaders. By visual comparison, you can see the extreme difference in loader construction. For you, this difference means a wide choice in adapting profitable techniques for your future earth-moving jobs. With either you get no-clutch, no-shock shifting . . forward operating visibility . . independent track reversal . . extra stability . . rugged construction . . operating ease.

EIMCO 105 EXCAVATOR

EIMCO 105 FRONT-END LOADER

THE 1½ YARD EIMCO EXCAVATING LOADER can dig and load rock and other tough materials on a comparable basis with boom-type equipment many times more costly. The bucket travels overhead to discharge, providing an operating cycle of 10 to 12 seconds. With 39,000 lb. digging force and "high leverage" rocker arm contour, it digs fast . . even in tough clay, hardpan, shale, glacial till, etc.

The Eimco 105 Excavator is especially adapted to all types of tunnel excavating . . loading blasted rock or overburden on narrow benches . . removing material on highway projects without blocking the motorist by-pass lane . . and many other applications where ability to load without turning is convenient and saves time. Spot trucks close behind and your Eimco 105 operator will keep haulage equipment working at a maximum pace every hour.

Write for Bulletin L-1048 today!

THE 2½ YARD EIMCO FRONT-END LOADER with 40,000 lb. break-out is an extremely flexible heavy-duty loader — ideal for digging off high banks . . handling fine, dusty or wet material . . dicharging into any size trucks spotted on a higher elevation . . cutting smooth grades where strong downward pressure is needed . . razing . . bulk loading . . and many other applications. Dozer blades, fork lifts and other attachments are readily fitted to this loader. It operates in 9' 6" headroom . . can reach over a 14' bin, hopper or gondola to discharge its cargo.

The loader mechanism operates at high mechanical efficiency and has many exclusive hydraulic system protective features. Combine this with extreme 105 tractor mobility and you get an earthmover that will make more trips every hour . . stay on the job longer . . get greater total production than competitive front-end units.

Write for Bulletin L-1050 today!

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

EIMCO

B-282

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number. If blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Bucyrus-Erie 200-W diesel dragline shipped in 1950; 125 ft. boom, 6 yd. heavy duty and 7 yd. light weight buckets; some spare parts included; good mechanical condition. Location Melbourne, Australia. Box 3682

Bucyrus-Erie Model 5-W Diesel dragline, 100′ boom, 25′ insert extension. Fairbanks-Morse main engine, auxiliary 100 HP Cummins for swing generator, includes two (2) Esco buckets, one five yard and one six yard. Owner using machine and can be inspected in actual operation, very good operating condition, located in Northern Illinois. Price including buckets and approximately $5000 worth of spares. $60,000 as is. Box 3716

2-W Monighan Walking-Type Dragline #492, 85′ boom, 2-year old D-13000 Caterpillar diesel engine #4S685, 2-yard Hendrix bucket, 2½ yard Page bucket, some spare parts, fair operating condition. Box 3708

Bucyrus-Erie 120-B dragline, 100′ boom with gantry mast, 4′ tracks, A-1 condition, located northern California.

THURMAN & WRIGHT
625 Market Street San Francisco, Calif.

Model 7-W Bucyrus-Erie dragline; machine is equipped with 180′ boom, powered with a Cooper-Bessemer GS-6 diesel engine; located in western New York. For price and other details contact Tecon Corp., 2nd Floor Davis Bldg., Dallas, Texas, Mr. E. R. Funk.

SMALL SHOVELS, CRANES, DRAGLINES—UP TO 2½ YDS.

Osgood Crane, Model 200, serial #4817, with independent boom hoist, 45′ boom and ¾-yd. bucket. Engine rebuilt. F.O.B. Salina, Kansas: $3500.

International TD14A Tractor, serial #27662, with Bucyrus-Erie hydraulic dozer, unit and lights. F.O.B. Salina, Kansas: $3500.

International TD14A Tractor, serial #29532, with Bucyrus-Erie hydraulic dozer, unit and lights. F.O.B. Salina, Kansas: $4250.

International TD14 Tractor, serial #TDF 860, with Bucyrus-Erie hydraulic dozer and unit. F.O.B. Salina, Kansas: $3000.

International TD14A Tractor, serial #31122, with hydraulic dozer, unit and Tulsa Winch Model 67L. F.O.B. Salina, Kansas: $4250.

Write—Wire—Phone
OEHLERT TRACTOR & EQUIPMENT CO., INC.
Salina, Kansas TAylor 3-4661

One—Koehring Model 304, ¾-yd. capacity with backhoe, powered by IHC UD-14-A diesel engine.
F.O.B. Evansville, Indiana $10,500

Write—Wire—Phone
BRANDEIS MACHINERY & SUPPLY CO.

J. A. Waddell	L. L. Freeman
P. O. Box 1705	P. O. Box 27
Louisville, Ky.	Evansville, Ind.
MElrose 7-4741	HArrison 3-4491

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

LORAIN MOTO-CRANE Model 414, 20-ton capacity, 40′ boom, Rudomatic Tagline, outriggers and screw jacks; mounted on standard factory carrier, 11:00x20—12 ply tires. Good operating condition $18,000

LIMA Model 802, 2-yd. Shovel, with 36″ pads, air controls, powered by a Cat D17000 diesel engine, with electric starter. Reconditioned, tops $32,500

P & H Model 655 Crane, 1¼-cu. yd., long frame, wide pads, 90′ boom, air controls, independent boom hoist, Cat D13000 engine. New 1952, excellent condition. Priced for quick sale.

P & H Model 255A, ¾-yd. dragshovel with 26″ tracks, diesel engine, electric starter. Excellent condition $15,500

LIMA Paymaster Truck Crane, Type E34, ¾-yd., 35′ boom, powered by 6-cylinder Buda gas engine; mounted on Brockway 6x6 truck carrier with ten 12:00x24 tires. Reconditioned $13,000

BUCYRUS-ERIE Model 15-B Dragshovel, ½-yd. powered by a Waukesha model HP526 gasoline engine with electric starter. Good condition .....$ 7,000

Subject to inspection & Prior Sale

H. O. PENN MACHINERY CO. INC.
140th St. & E. River CYpress 2-4800
New York 51, New York

Northwest 25, combination dragline, clamshell shovel with Murphy diesel engine, serial #14716.
Price f.o.b. Greensboro, N. C. $14,000
Northwest 25, dragline with 40′ boom (one 5′ insert), 3-71 GM engine, ¾-yd. TS Hendrix bucket and 28″ flat bottom shoes.
Price f.o.b. Greenville, N. C. .....$ 8,000
Unit Model 1020 dragline w/gasoline Chrysler engine, long wide crawler frame, 30″ shoes, ¾-yd. Hendrix bucket and 40′ boom.
Price f.o.b. Greenville, N. C. .....$ 7,500
Northwest 25 shovel front with ¾ yd. dipper.
Price f.o.b. Greensboro, N. C. .....$ 1,500

E. F. CRAVEN COMPANY
Greensboro, N. C.

Bucyrus-Erie 38-B 1½-yd. shovel, serial #71215 (1949), with Cat D13000, 33″ wide treads, wired for lights. Located in Denver; good condition.

Lorain L-80 1¾-yd. shovel, serial #23550 (1953), with Cat D337 engine, fluid coupling and air control. In our Denver Yard; machine used 2800 hours, engine 1800 hours; entire unit in very good condition.

Pioneer 101 asphalt plant (1950), diesel electric powered; complete with power and including the gradiation unit, 90″x24′ drier, dust collector, hot elevator, cold conveyor, two aggregate feeders and Cleaver-Brooks steam generator. Located in Denver; condition and appearance good.

Bucyrus-Erie 22-B ¾-yd. dragshovel, serial #73086 (1949), with new-type cambered boom, powered by GM 3-71 diesel engine. Located in Denver; very good condition.

THE COLORADO BUILDERS' SUPPLY CO.
1534 Blake Street WEst 5-3571
Denver, Colorado

H-3 Hydrocrane-Hoe, serial #108671, GMC 352-24 truck, 2-speed rear axle and no-spin differential lock. Price: Crane only, $9000; crane and hoe, $10,500. 1st class operating condition. Write: Mr. R. F. "Joe" Phillips, Richardson Tractor Co., P. O. Box 330, Clarksburg, W. Va.

SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

H-3 Hydrocrane, serial #97026, with 29″ magnet, International L-162 truck serial #63731. Price: Less generator and magnet eq. $8000; including generator and magnet eq. $10,500. Write: Browning-Ferris Machinery Co., Mr. R. H. Siler, P. O. Box 7966, Dallas 26, Texas.

Northwest Model 95, serial #14294-11394C; Model 21 Murphy diesel, serial #15593; 80′ boom crane/dragline revolving fairlead; folding gantry; 2-yd. capacity; holding line—⅞″ x 190′; closing line—⅞″ x 215′; tag line—⅜″ x 100′; 38″ wide tracks.

Northwest Model 95, serial #14405-11692C; Model 21 Murphy diesel, serial #MD10772; 80′ boom crane/dragline; folding gantry; 2-yd. capacity; holding line—⅞″ x 190′; closing line—⅞″ x 215′; tag line—⅜″ x 100′; 38″ wide tracks. Box 3722

2½-YD. SHOVEL, 1956 P&H Mod: 955A. Powered by Cat diesel 1FD337 with electric starter, 26′ shovel boom, 19′ dipper, air over hydraulic brakes on both hoist and digging booms, also 100′ crane boom and 25′ jib, as crane rated at 50 tons at 15′. BREEN, 1165 Longwood Ave., Bronx 59, N. Y. Phone LUdlow 9-6016.

2-Yd. MODEL 820 LORAIN CRAWLER CRANE equipped with 100′ boom, Cat diesel engine. Entire machine in very good working condition and is available immediately; located in Milwaukee.

2-Yd. MODEL 820 LORAIN CRAWLER CRANE-SHOVEL COMBINATION; equipped with Cat D-13000 diesel engine, standard crawlers, 70′ boom, fairlead, maximum counterweight, new boom and like-new shovel attachment. Good condition; located at Milwaukee; available immediately.

1½-Yd. KOEHRING MODEL 605 CRANE-HOE COMBINATION; Cat D-13000 diesel engine, 60′ boom, new hoe attachment. Excellent condition. Call for location to inspect.

1¼-Yd. MODEL 33-B BUCYRUS-ERIE ERECTION CRANE with 100′ boom and jib, independent boom hoist, gas power. Very good condition; will be available late in June. Priced right for a big machine.

1-Yd. MODEL LS-90 LINK-BELT SHOVEL, Waukesha gas power; entire unit in like-new condition. Priced at about half of new replacement cost.

¾-Yd. MODEL 25 NORTHWEST CRANE-SHOVEL COMBINATION, equipped with Cat. D-4600 diesel engine, 45′ boom, tagline reel, fairlead. Excellent condition. Located at our Milwaukee yard.

½-Yd. UNIT CRAWLER-MOUNTED DRAG-SHOVEL, equipped with Chrysler Industrial gas engine. Fair condition and priced to sell. See at our yard.

H-2 HYDROCRANE in good working condition. 22-B, shovel attachment included, ¾-yd. dipper, in good condition: $1500, f.o.b. our yard, Milwaukee, Wis.

SHOVEL ATTACHMENT for Model 22-B Bucyrus-Erie excavator, excellent condition, available at once, priced to sell.

J. P. WAITE CONSTRUCTION CO.
3308 West Pierce St. Milwaukee 1, Wis.
Phone: EVergreen 4-1900

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

FOR SALE
CONSTRUCTION EQUIPMENT

1055 P&H Drag, 80', 3½ yard
1201 Lima Dragline, 85', 3 yd.
40-A Marion Drag, 90', 2½ yd.
955 P&H Dragline, 90', 2½ yd.
54-B Bucyrus-Erie Drag, 85', 2½ yd.
3500 Manitowoc Drag, 85', 2½ yd.
95 Northwest Drag, 80' boom
903 Osgood Dragline, 70', 2 yd.
802 & 604 Lima Cranes
43-B Bucyrus-Erie Drag, 70', 1¾ yd.
1055 P&H 3½ yd. Standard Shovel
1201 Lima 3½ yd. Standard Shovel
955 P&H 2½ yd. Standard Shovel
80-D Northwest 2½ yd. Standard Shovel
802 Lima Comb. H.L. Shovel—Drag
51-B Bucyrus-Erie 2-yard Shovel
38-B Bucyrus-Erie 1½ yd. Shovel-Crane
37-B Bucyrus-Erie 1½ yard Shovel
6 Northwest 1½ yd. Shovel
44 Lima 1 yard Backhoe
25 Northwest Comb. Shovel-Drag
Unit 1020 ¾ yard Shovel
22-B Bucyrus-Erie Backhoe
15-B Bucyrus-Erie Backhoe
255 P&H Truck Cranes
424 Lorain Truck Crane
22-B Bucyrus-Erie Truck Crane
LC-90 Link Belt Speeder Truck Crane
TL-20 Lorain Truck Crane
Euclid Trucks—Bottom & Rear Dump
600 Reich Heavy Truck Mounted Rotary Air Drills
58-BH Joy Champion Rotary Air Drills
42-T, 29-T & 27-T Well Drills
Davey Rotary Truck Air Drills
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Garwood, LeTourneau, Caterpillar, Euclid & Bucyrus-Erie Scrapers
Caterpillar & Allis-Chalmers Dozers, Front End Loaders, Graders
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Shovel, Drag, Crane & Backhoe Attach. Drag & Dipper Buckets for most makes and models.

FRANK SWABB
EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
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One Bucyrus-Erie Model 41-B, 3 motor AC electric shovel, serial no. 10796, 1½-yd. dipper, cat-mounted, 26" treads; 22'6" boom, 15' handle; good operating condition. Many replacement parts for swing and crowd machinery recently installed or available. Located Mid-West.

One Bucyrus-Erie Model 52-B, Ward-Leonard electric shovel, serial no. 11395, equipped for 3 phase, 60 cycle, 440 volt operation; 2¼ cubic yard dipper, 30' boom, 18' handle; equipped with power boom hoist and electric light plant. Well maintained and in good operating condition. Caterpillar units recently overhauled. Located Mid-West. Box 3710

Model H-5, ½-yd. clamshell bucket, tagline reel. Price: Clamshell, $900; tagline, $350. Write: Euclid Sales & Service, Inc., Mr. F. M. Shelden, 5231 Manchester Ave., St. Louis 10, Mo.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

P&H 1055 diesel shovel with 28' boom, Marion 492 sticks and 2½-yd. dipper; Buda diesel engine; quantity of spare parts available at half price. Price f.o.b. Hyde Park, Vt.: $17,500. The Ruberoid Co., Hyde Park, Vt.

MISCELLANEOUS EQUIPMENT

2—Model 27-T blast hole drills, gasoline powered, crawler mounted, complete with tools and lines.
1—#8 Bit dresser equipped to dress 7" bits.
BEN TULLY & SONS, Poyntelle, Pa. Phone Pleasant Mount 2658.

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Three (3) Dumptors, serial number 2906, 2907, 3035; powered by GM-471 diesel engine; 16.00x24 front, 10.00x20 rear tires; good operating condition.
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One Bucyrus-Erie #12 Bit Dresser. Price f.o.b. Hyde Park, Vt.: $2,500. THE RUBEROID CO., Hyde Park, Vt.

TRACTOR-LOADER, 1956 Allis-Chalmers, Model HD-16GC, serial 1309; torque convertor, hydraulic steering controls, 8 bucket teeth and general purpose bucket; machine worked 9 months, has been completely rebuilt. BREEN, 1165 Longwood Ave., Bronx 59, N. Y. Phone LUdlow 9-6016.

1—1952 TD 14 angle dozer; 1—1950 TD 14 angle dozer; 1—1953 TD 9 high lift; 1—1950 LS Link-Belt shovel; 1—41 model ¾-yard Lorain; 1—Galion grader model 101. All equipment located in Hazard, Ky. Priced for quick sale. Bingham Contracting Co., Hazard, Ky.

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ONE—2¼-YD. COAL LOADING DIPPER, NEW FOR 38-B. LOCATED NEAR PITTSBURGH. $2500.
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22-B Unused Shovel
Lima 1201 Boom 85'
22-B Crane Boom
Northwest Model 6 Boom
Northwest 80-D Backhoe
Northwest 25 Backhoe
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Lorain 82 Backhoe
Bucyrus-Erie 38-B Backhoe
Lima 34-E Camelback Hoe
Lorain 50 Hoe Bucket & Arm
Unit 1020 Shovel.

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Model 27-T blast hole drill, serial No. 19628, Waukesha gasoline power, crawler-mounted, 33' one-piece all-steel derrick complete with tools in good working order. Located in Missouri. Priced to sell. Box 3719

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FORD MODEL JD-1025 GASOLINE ENGINE with radiator-flywheel, ring gear and starter. $200.

***ALL PRICES—**
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One 2½-yd. Esco shovel dipper #629 for Bucyrus 52-B machine, good condition. Price: $2000 at Rockport, Calif. Rockport Redwood Co.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 van runner; spare liners Box 3696

Model 27-T blast hole drill, serial No. 18269, Waukesha gasoline power, crawler-mounted, 33' one-piece all-steel derrick complete with tools in good working order. Located in Missouri. Priced to sell. Box 3718

1—Esco 1½ C.Y. Orange Peel Bucket
2—Shovel fronts for Link-Belt K570 machines
2—Shovel fronts for Link-Belt K360 machines
1—Shovel front for Osgood Model 1007 machine
1—Shovel front for Lorain TL20 truck crane
2—Shovel fronts for Lima paymaster machines
2—Shovel fronts for Northwest Model "25" machines
1—Shovel front for Lima "502" machine, 1¼ C.Y.
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Excellent overseas opportunity for two walking dragline operators and one mechanic. Outstanding salary and bonus, with employment guaranteed for at least one year. Travel and living expenses furnished. Working location—India. Available Spring, 1958. Box 3725

POSITIONS WANTED

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Available immediately — Bucyrus-Erie Model 51-B dragline clamshell lifting crane—100' boom, 20' jib, long and wide treads. Independently propelled. For rent by week or month.
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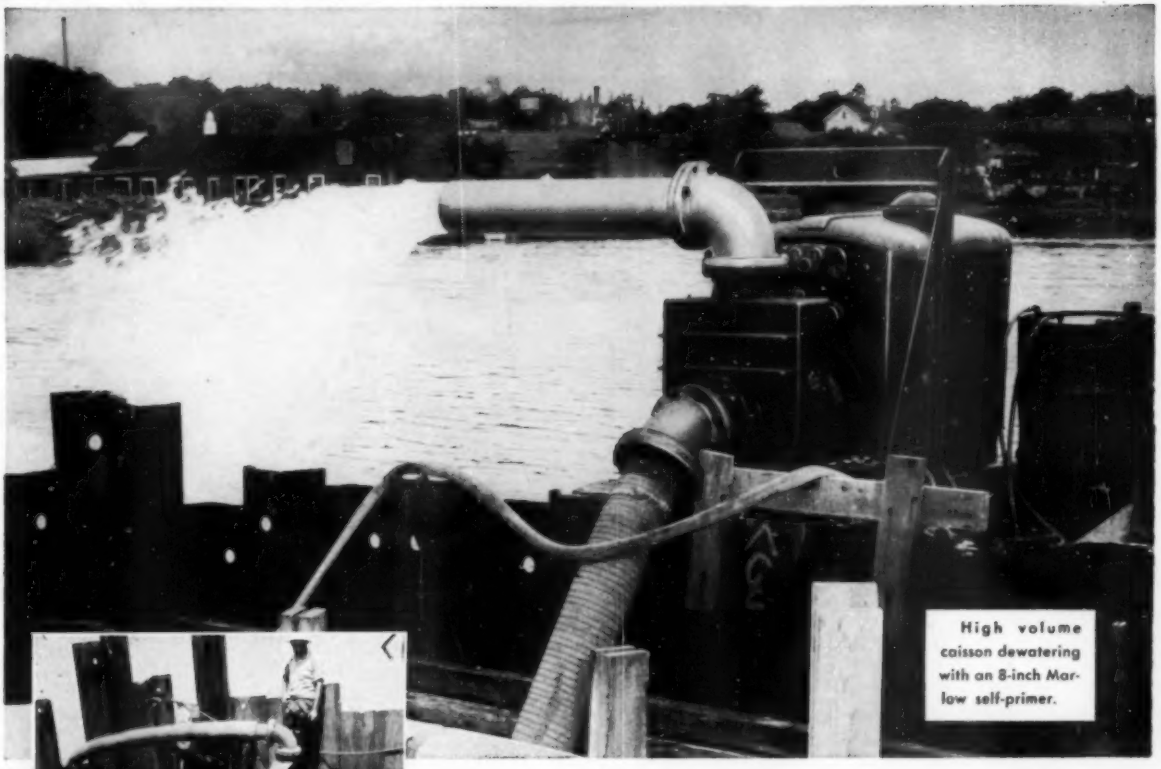
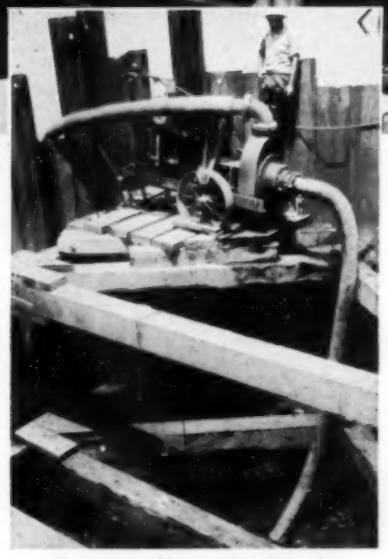
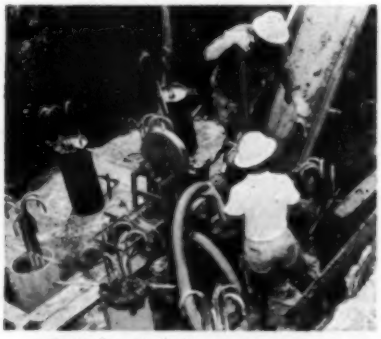


High volume caisson dewatering with an 8-inch Marlow self-primer.



No water problem on this bridge footing with a dependable Marlow "Diffuser Primed" pump on the job.



A Marlow Mud Hog moving concrete wastes. These famous "Mud Hogs" are suitable for pumping almost any heavy waste on the job.

Connecticut Turnpike Moves Ahead On Schedule

Dependable Dewatering A Major Help

The new Connecticut Turnpike is an important part of the Nation's enlarged highway building program. It is estimated that total construction costs will be in the neighborhood of $500,000,000. Running through one of the country's most densely populated areas, it reaches 128 miles from Greenwich, in the New York City vicinity, to Killingly, near the Rhode Island border.

Along the highway's entire length, many pumps were used to dewater excavations, empty caissons, supply equipment, move concrete waste, and other heavy or sluggish liquids. The photographs on this page show the two principle types of application, Marlow fast-priming centrifugals for high volume pumping and Marlow Mud Hogs for heavy or muddy fluids. Superintendents and mechanics on the job say that they can depend on their Marlow pumps and they particularly like their self-cleaning and non-clogging features as well as their ability to stay on the job under an extra-heavy work schedule.

With one of the world's finest and most complete line of pumps, Marlow has an enviable reputation for service and dependability. Marlow pumps are available quickly from three factories and dealers in all localities. Look for the heading "Marlow Pumps" in the Yellow Pages of your classified telephone directory. Ask your Marlow dealer about the Marlow line of contractors' pumps.

Marlow PUMPS

6-271

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